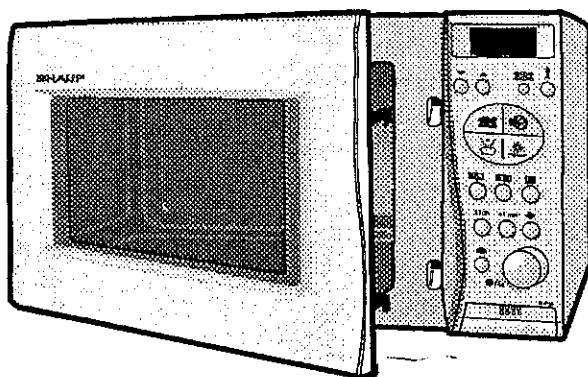


SHARP® SERVICE MANUAL

S7601R4P58EHW

MICROWAVE OVEN WITH GRILL AND BOTTOM HEATER



MODELS **R-4P58(B)**
R-4P58(W)
R-4P58(BK)
R-4P58(W)N
R-4P58(W)F

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

CAUTION MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured.

Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

VARNING MICKROVAGSSTRÅLING

Personal får inte utsättas för mikrovågsenergi som kan stråla från magnetronen eller andre mikrovågsstrålande anordningar om dessa är felanslutna eller används på fel sätt. Alla in-och utgångsanslutningar för mikrovågor, vågledare, flänsar och packningar måste vara fast anslutna.

Mikrovågsgeneratoren får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i en öppen vågledare eller antenn när mikrovågsgeneratoren är påkopplad eller laddad.

VAROITUS MIKROAALTOSÄTELYÄ

Käyttäjä ei saa joutua alttiiksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään tai jos se kytketään väärin. Kaikkien mikroaaltoliitäntöjen sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivistesten tulee olla varmistettuja.

Mikroaaltouunnia ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu. Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

ADVARSEL MIKROBØLGESTRÅLING

Personell må ikke utsettes for mikrobølge-energi som kan utståles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet. Alle inn-og ut-tilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.

Aldri bruk apparatet med mindre en mikrobølge-absorberende last er plassert i ovnsrommet.

Aldri se direkte inn i en åpen bølgeleder eller antenne imens apparatet er strømførende.

ADVARSEL MIKROBØLGEBESTRÅLING

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og-udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.

Anvend aldrig ovnen uden en mikrobølgesabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antenne, mens ovnen er i brug.

SERVICE MANUAL

SHARP

MICROWAVE OVEN WITH GRILL AND BOTTOM HEATER

R-4P58(W)/ R-4P58(B)/ R-4P58(BK)

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

WARNING

- Note: The parts marked "*" are used in voltage more than 250V. (Parts List)
- Anm: Delar märket med "*" har en spänning överstigande 250V.
- Huom: Huolto-ohjeeseen merkitty "tähdellä" osat joissa jännite on yli 250 V.
- Bemerk: Deler som er merket "asterisk" er utsatt for spenninger over 250V til jord.
- Bemærk: "Dele mærket med stjerne benyttes med højere spænding end 250 volt.

WARNING

- Never operate the oven until the following points are ensured.
- (A) The door is tightly closed.
 - (B) The door brackets and hinges are not defective.
 - (C) The door packing is not damaged.
 - (D) The door is not deformed or warped.
 - (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

Removal of the outer wrap gives access to potential above 250V.

All the parts marked "Δ" on the parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

Never operate the Grill and/ or Bottom heater with the oven outer cabinet removed. (Because air flow is eliminated, and the excess heat generated on adjacent components). **It can cause permanent damage or fire.**

SHARP CORPORATION

OSAKA, JAPAN

SERVICING

PRODUCT SPECIFICATIONS

GENERAL INFORMATION

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT COMPONENTS

TROUBLESHOOTING GUIDE AND TEST PROCEDURE

TOUCH CONTROL PANEL

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT

TEST DATA AT A GLANCE

WIRING DIAGRAM

PARTS LIST

SERVICING

WARNING TO SERVICE PERSONNEL

- (GB)** Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts will result in electrocution.
High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test carried out.

- (NL)** Magnetronovens bevatten circuits die een zeer hoge spanning en stroom kunnen voortbrengen. Contact met de volgende onderdelen kan elektrocutie tot gevolg hebben.
Hoogspanningscondensator, hoogspanningstransformator, magnetron, hoogspanningsgelijkrichter, hoogspanningskabelboom.

VERGEET DE VOLGENDE 3 STAPPEN NIET

- 1) Haal de stekker uit het stopcontact.
- 2) Open de deur en zorg ervoor dat hij niet dicht kan vallen.
- 3) Ontlaad de hoogspanningscondensator.

PAS OP VOOR DE ELECTRICHE LADING VAN DE HOOGSPANNINGSCONDENSATOR

De hoogspanningscondensator blijft nog ongeveer 60 seconden lang opgeladen, nadat de oven is uitgeschakeld. Wacht 60 seconden voordat u de verbinding van de hoogspannings-condensator (m.a.w. de verbindingsdraad van de hoogspanningsgelijkrichter) met een geïsoleerde schroevendraaier kortsluit tegen het chassis.

Sharp beveelt ten sterkste aan dat, voor zover mogelijk, defecten worden opgespoord wanneer de stekker uit het stopcontact is gehaald. Soms is het nodig om de stroomtoevoer weer tot stand te brengen nadat de buitenmantel verwijderd is. Herhaal dan de bovengenoemde 3 stappen en haal de elektrische draden uit de primaire zijde van de vermogenstransformator. Zorg ervoor dat deze draden geïsoleerd blijven van andere elementen en van het chassis van de oven. (Gebruik zo nodig isolatieband.) Wanneer de test is uitgevoerd, herhaalt u de bovenstaande 3 stappen en verbindt u de elektrische draden weer aan de primaire zijde van de vermogenstransformator.

VERGEET DE VOLGENDE 4 STAPPEN NIET

- 1) Sluit de draden weer aan die zijn losgehaald voor de test.
- 2) Plaats de buitenmantel weer om het toestel heen (kabinet).
- 3) Stop de stekker weer in het stopcontact.
- 4) Zet de oven aan. Controleer alle functies.

Magnetronovens mogen niet leeg aangezet worden. Om te controleren of er microgolf-energie binnen de oven wordt geproduceerd, plaatst u een mok met koud water op de draaitafel van de oven, sluit de deur, zet de oven op HIGH en stelt de klok van de magnetron in op twee (2) minuten. Wanneer de twee minuten voorbij zijn (klok staat op nul), controleert u voorzichtig of het water heet is. Indien het water nog steeds koud is, herhaalt u de allereerste drie stappen en controleer nogmaals de aansluitingen naar de geteste onderdelen.

Wanneer alle reparaties zijn uitgevoerd en de oven weer in elkaar is gezet, moet de het magnetronvermogen worden gecontroleerd en moet worden gecontroleerd of er geen microgolflekage is.

(E)

Los hornos de microondas contienen circuitos eléctricos capaces de producir voltajes de alta tensión y descargas eléctricas. Para evitar el riesgo de electrocución, absténgase de tocar los siguientes componentes: condensador de alta tensión, transformador de alta tensión, magnetron, dispositivo del rectificador de alta tensión y arnés de alta tensión.

RECUERDE LA COMPROBACION 3D

- 1) Desconecte la alimentación.
- 2) Deje la puerta abierta y calzada.
- 3) Descargue el condensador de alto voltaje.

ADVERTENCIA SOBRE LA CARGA DEL CONDENSADOR DE ALTO VOLTAJE

El condensador de alto voltaje permanece cargado unos 60 segundos después de haber apagado el horno. Espere 60 segundos y luego ponga en cortocircuito la conexión del condensador de alto voltaje (esto es, del conductor de conexión del rectificador de alto voltaje) al chasis con un destornillador de mango aislado.

Se recomienda encarecidamente que siempre que sea posible la localización de fallos se realice con la alimentación desconectada. Puede ser que en algunos casos sea necesario conectar la alimentación después de haber retirado la carcasa exterior. En este caso, realice las comprobaciones 3D y luego desconecte los conductores del primario del transformador de alimentación. Asegúrese de que estos conductores permanezcan aislados de otros componentes y del chasis del horno. (Use cinta aislante si es necesario). Cuando termine la prueba efectúe las comprobaciones 3D y reconecte los conductores al primario del transformador de alimentación.

RECUERDE LA COMPROBACION 4C

- 1) Conecte todos los componentes desconectados de los componentes durante la prueba.
- 2) Coloque la carcasa exterior (cabin).
- 3) Conecte la alimentación.
- 4) Compruebe todas sus funciones después de poner en marcha el horno.

Los hornos de microondas no deben funcionar vacíos. Para comprobar la presencia de energía de microondas dentro de una cavidad, coloque una taza de agua fría en el plato giratorio del horno, cierre la puerta y ponga la potencia en HIGH (alta) y coloque el temporizador en dos (2) minutos. Cuando transcurran los dos minutos (temporizador a cero) compruebe cuidadosamente que el agua se ha calentado. Si el agua permaneciese fría, efectúe las comprobaciones 3D y vuelva a examinar las conexiones de los componentes que han sido probados.

Cuando haya terminado la intervención en el equipo y el horno haya sido ensamblado de nuevo completamente, deberá comprobar la potencia de salida de microondas y realizar una prueba de fugas de microondas.

(SV)

Mikrovågsugnar innehåller kretsar som producerar mycket höga spänningar och strömmar.

Kontakt med följande komponenter kan leda till dödsfall:

Högspänningskondensator, transformator, magnetron, högspännings likriktare, högspännings kablage.

KOM IHÅG ATT KONTROLLERA 3 STEG

- 1) Koppla från strömkällan.
- 2) Öppna dörren på glänt.
- 3) Ladda ur högspänningskondensatorn.

VARNING FÖR LADDNINGEN I HÖGSPÄNNINGSKONDENSATORN

Högspänningskondensatorn är laddad i 60 sekunder efter det att ugnen stängts av. Vänta 60 sekunder och korrslut sedan kondensators anslutning (dvs anslutningen till högspänningslikriktaren) till chassiet med hjälp av en isolerad skruvmejsel.

Sharp rekommenderar att felsökning sker med strömmen fränkopplad. Ibland kan det var nödvändigt att koppla på strömmen efter det att höljet avlägsnats, utför da 3 Steg kontrollen och koppla sedan från ledarna till transformatorns primärsida. Se till att ledarna är isolerade från andra komponenter och chassiet. (Använd isoleringsband om det behövs). När Du testat färdigt utför Du 3 Steg kontrollen och ansluter ledningarna till transformatorns primärsida igen.

KOM IHÅG ATT KONTROLLERA 4 STEG

- 1) Anslut alla ledningar som använts vid testning
- 2) Sätt tillbaka ytterhöljet.
- 3) Anslut strömkällan på nytt.
- 4) Sätt på ugnen. Kontrollera alla funktioner.

Mikrovågsugnar får inte användas tomma. Kontrollera mikrovågsstrålningen i olika delar av ugnen genom att placera en kopp med kallt vatten på ugnens tallrik, stäng dörren, ställ in HIGH och ställ in 2 minuter på timern. När två minuter har gått (timern visar 0) kontrollerar du om vattnet är varmt. Om vattnet fortfarande är kallt utför Du 3 steg kontroller och kontrollerar anslutningarna till varje enskild komponent på nytt.

När all service är klar och ugnen ihopskruvad skall ugnens uteffekt och eventuellt mikrovågsläckage kontrolleras.

1

I forni a microonde contengono un circuito elettrico in grado di generare tensioni e correnti estremamente elevate. L'eventuale contatto con i seguenti componenti può causare la folgorazione: condensatore ad alta tensione; trasformatore ad alta tensione; magnetron; rettificatore alta tensione; cablaggio ad alta tensione.

TRE OPERAZIONI IMPORTANTI PER INCOMINCIARE

- 1) Scollegare l'alimentazione elettrica.
- 2) Verificare che la porta sia bloccata in posizione aperta.
- 3) Scaricare il condensatore ad alta tensione.

ATTENZIONE AL CONDENSATORE AD ALTA TENSIONE: PUO ESSERE CARICO

Il condensatore ad alta tensione rimane carico per circa 60 secondi dopo lo spegnimento del forno. Occorre quindi aspettare 60 secondi prima di cortocircuitare, utilizzando un cacciavite con impugnatura isolata, il collegamento del condensatore ad alta tensione (cioè del conduttore di collegamento del raddrizzatore ad alta tensione) sul telaio del forno.

Sharp raccomanda, nei limiti del possibile, che la ricerca dei guasti avvenga in assenza di alimentazione elettrica. In alcuni casi tuttavia, può essere necessario alimentare l'apparecchio dopo aver rimosso la scatola esterna. In questo caso eseguire i tre controlli sopra citati e quindi scollegare i connettori dal primario del trasformatore. Assicurarsi che tali connettori non vengano a contatto con altri componenti, né con il telaio del forno (fare uso, se necessario, di nastro isolante). Al termine dell'intervento, eseguire nuovamente i tre controlli e ricollegare i conduttori al primario del trasformatore.

QUATTRO VERIFICHE IMPORTANTI DA NON DIMENTICARE

- 1) Ricollegare tutti i conduttori staccati dai vari componenti durante l'intervento.
- 2) Rimontare la scatola esterna.
- 3) Ripristinare l'alimentazione elettrica.
- 4) Rimettere in funzione il forno. Controllare tutte le funzioni.

I forni a microonde non devono mai funzionare a vuoto. Per verificare la presenza di energia da microonde all'interno di una cavità, mettere una tazza di acqua fredda sul piatto rotante del forno, chiudere la porta, regolare la potenza su HIGH ed impostare il temporizzatore su due (2) minuti. Trascorsi i due minuti (temporizzatore a zero), controllare accuratamente che ora l'acqua sia calda. Se l'acqua è rimasta fredda, eseguire i tre controlli iniziali e verificare nuovamente i collegamenti del componente in questione.

Dopo aver portato a termine le operazioni di manutenzione e rimontato il forno, è necessario controllare la potenza delle microonde emesse ed eseguire un test per verificare che non vi sia alcuna dispersione.

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION			
Power Requirements	230 Volts 50 Hertz Single phase, 3 wire earthed			
Power Consumption	Microwave cooking 1.55 kW Approx. 7.3 A			
	Grill cooking	Top Grill mode	1.25 kW	Approx. 5.4 A
		Bottom Heater mode	0.85 kW	Approx. 3.7 A
		Top and Bottom mode	2.05 kW	Approx. 9.5 A
Dual cooking	Micro and Top Grill	2.8 kW	Approx. 12.7 A	
	Micro and Bottom Heater	2.35 kW	Approx. 11 A	
Power Output	900 W nominal of RF microwave energy (measured by method of IEC 705) Operating frequency 2450 MHz			
Grill heating element Power Output (Top Grill)	1200 W (600 W x 2)			
Bottom heating element Power Output	800 W			
Case Dimensions	Width	520 mm		
	Height	309 mm including foot		
	Depth	436 mm		
Cooking Cavity Dimensions	Width	349 mm		
	Height	189 mm		
	Depth	357 mm		
Turntable diameter	325 mm			
Control Complement	Touch Control System Clock (1:00 - 12:59 or 0:00 - 23:59) / Timer (0 - 90 minutes) Microwave Power for Variable Cooking Repetition Rate; 100% Full power throughout the cooking time 70% approx. 70% of FULL Power 50% approx. 50% of FULL Power 30% approx. 30% of FULL Power 10% approx. 10% of FULL Power LESS (▼)/MORE (▲) buttons, LANGUAGE button INFORMATION button, SNACK button PIZZA button, AUTO COOK/DEFROST button MICROWAVE power button DUAL COOKING button, GRILL button STOP button, MINUTE PLUS button START button, CLOCK setting button TIME/WEIGHT knob			
Set Weight	Approx. 19 kg			

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

IMPORTANT

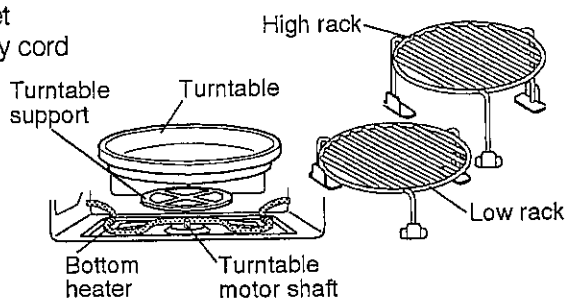
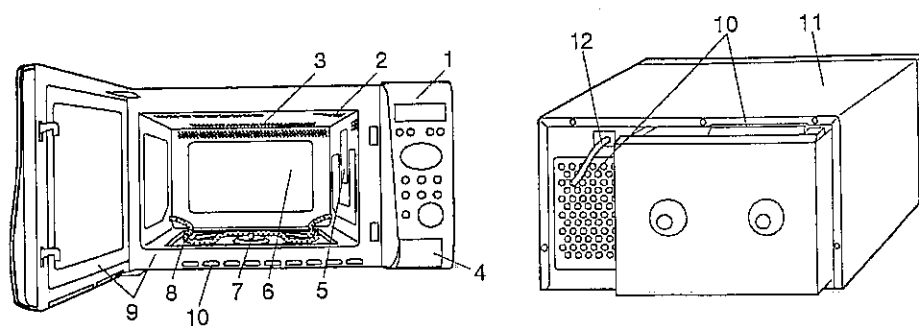
THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

APPEARANCE VIEW

OVEN

1. Control panel
2. Oven lamp
3. Grill heating element (Top Grill)
4. Door opening button
5. Waveguide cover
6. Oven cavity
7. Turntable motor shaft
8. Grill heating element (Bottom Heater)
9. Door seals and sealing surfaces
10. Ventilation openings
11. Outer cabinet
12. Power supply cord



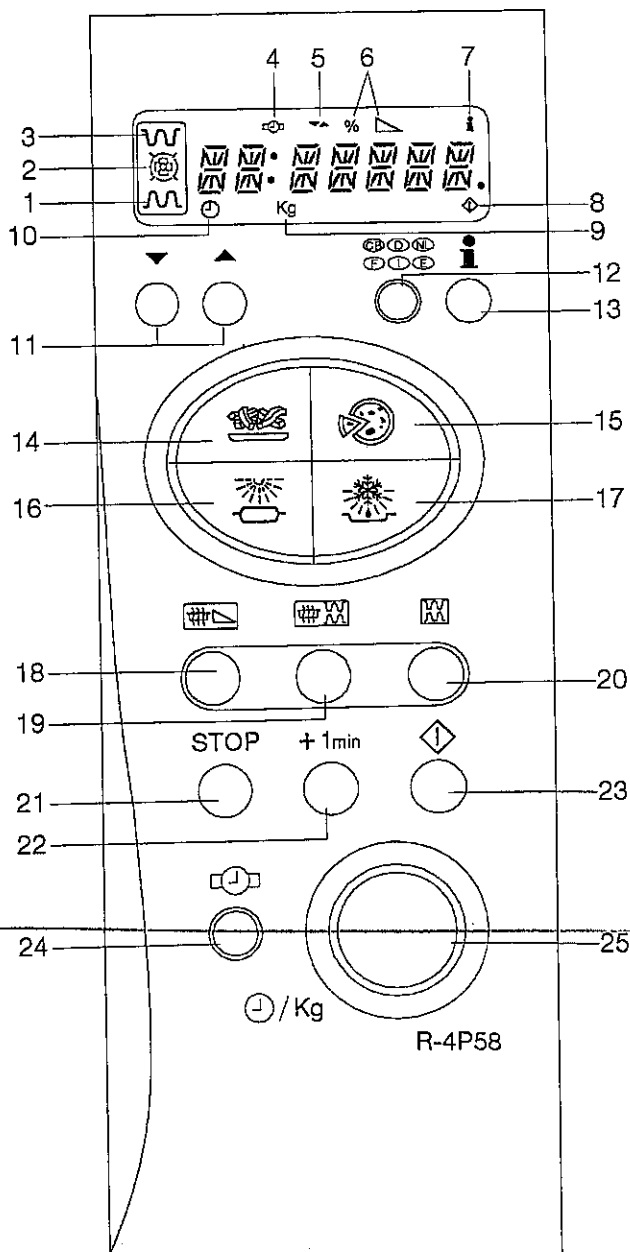
1. Ensure that the bottom heater is in the lowest position as shown in the figure. As it is possible to move it up and down to help with cleaning.
2. Place the turntable support over the turntable motor shaft on the floor of the cavity.
3. Then place the turntable on to the turntable support.

DIGITAL DISPLAY AND INDICATORS

1. GRILL (bottom heater) indicator.
2. MICROWAVE indicator
 - ⊙ Microwave cooking indicator
 - ✕ Microwave defrosting indicator
3. GRILL (top grill) indicator.
4. CLOCK indicator.
5. LESS /MORE indicator.
6. Microwave power level indicator
7. INFORMATION indicator
8. Cook indicator
 - During the cooking, the indicator will light up.
9. Kg Indicator.
10. TIME indicator

OPERATING BUTTONS

11. LESS (▼)/MORE (▲) buttons
12. LANGUAGE button
13. INFORMATION button
14. SNACK button
15. PIZZA button
16. AUTO COOK button
17. AUTO DEFROST button
18. MICROWAVE power button
19. DUAL COOKING button
20. GRILL button
21. STOP button
22. MINUTE PLUS button
23. START button
24. CLOCK setting button
25. TIME/WEIGHT knob



OPERATION SEQUENCE

OFF CONDITION

Closing the door activates the primary latch switch and the stop switch.

IMPORTANT:

When the oven door is closed, the contacts **COM-NC** of the monitor switch must be open. When the microwave oven is plugged in a wall outlet (230V / 50Hz), the line voltage is supplied to the noise filter and the control unit.

Figure O-1 on page 29

- The oven display will flash "PRESS STOP" in 6 language.
- Press the STOP button. The oven display will flash "SELECT LANGUAGE" in 6 language.
- Select language as follows.
 - Choose desired language by pressing the LANGUAGE button.
 - Start the setting by pressing the START button. The oven display will flash "SET CLOCK" in selected language.
- Set the clock as follows.
 - Choose the 12 hour clock or the 24 hour clock by pressing the CLOCK setting button.
 - Set the hours by rotating the TIME/WEIGHT knob.
 - Change from hours to minutes by pressing CLOCK setting button.
 - Set the minutes by rotating the TIME/WEIGHT knob.
 - Start the clock by pressing the CLOCK setting button.

NOTE:

- If you do not want to set the clock, press the STOP button once after language is chosen. " : " will appear on the display. When the operation of the oven is finished, " : " will appear on the display instead of the time of day.
- The oven can be also used when the language and/or the clock is not set..
- When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time by turning the TIME/WEIGHT knob and start the oven by pressing START button.

Function sequence Figure O-2 on page 30

CONNECTED COMPONENTS	RELAY
Oven lamp, Turntable motor	RY1
High voltage transformer	RY2
Grill heating element	RY3
Bottom heating element	RY4
Fan motor,	RY5

- The line voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
- The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..

- The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
- When the cooking time is up, a signal tone is heard and the relays **RY1 + RY2 + RY5** go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and turntable motor are cut off.
- When the oven door is opened during a cooking cycle, the switches come to the following condition.

Switch	Contact	Condition	
		During Cooking	Oven Door Open (No cooking)
Primary latch Switch	COM-NO	Closed	Opened
Stop switch	COM-NO	Closed	Opened
Monitor Switch	COM-NO	Closed	Opened
	COM-NC	Opened	Closed

The circuit to the high voltage transformer, fan motor and turntable motor are cut off when the primary latch switch and stop switch are made open. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay **RY1** stays closed. Shown in the display is remaining time.

6. MONITOR SWITCH CIRCUIT

The monitor switch **SW3** is mechanically controlled by the oven door, and monitors the operation of the primary latch switch **SW1**.

- When the oven door is opened during or after the cycle of a cooking program, the primary latch switch **SW1** and stop switch **SW2** must open their contacts first. After that the contacts (**COM-NC**) of the monitor switch **SW3** can be closed.
- When the oven door is closed, the contacts (**COM-NC**) of the monitor switch **SW3** must be opened. After that the contacts of the primary latch switch **SW1** and the stop switch **SW2** are closed.
- When the oven door is opened and the contacts of the primary latch switch **SW1** remain closed, the fuse **F1** T160mA will blow, because the monitor switch is closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the line voltage is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay **RY2**. The following levels of microwave power are given.

SETTING	32 sec. ON	Approx.
100%	32 sec. ON	Approx. 100%
70%	24 sec. ON 8 sec. OFF	Approx. 70%
50%	18 sec. ON 14 sec. OFF	Approx. 50%
30%	12 sec. ON 20 sec. OFF	Approx. 30%
10%	6 sec. ON 26 sec. OFF	Approx. 10%

Note: The On/Off time ratio does not exactly correspond to the percentage of microwave power, because approx. 3 seconds are needed for heating up the magnetron filament.

GRILL COOKING CONDITION

The oven has three grill cooking condition. They are the TOP GRILL mode, BOTTOM HEATER mode and TOP AND BOTTOM mode.

TOP GRILL MODE

In this mode, the food is cooked by the grill heating elements (top grill). Enter the cooking time by rotating the TIME/WEIGHT knob and select the TOP GRILL mode by pressing the GRILL button once. When the START button is pressed, the following operations occur:

Figure O-3(a) on page 30

1. The relay RY1 + RY3 + RY5 are energized.
2. The numbers of the digital readout start the count down to zero.
3. Then the grill heating elements (top), turntable motor, oven lamp and fan motor are energized.
4. Now, the food is grilled by the grill heating elements.
5. Upon completion of the selected cooking time, audible signal sounds and the contacts of relays RY1 + RY3 are opened, then the grill heating elements (top), turntable motor and oven lamp are de-energized.
6. The relay RY5 stays closed for five (5) minutes, and the fan motor operates.

BOTTOM HEATER MODE

In this mode, the food is cooked by the bottom heating element. Enter the cooking time by rotating the TIME/WEIGHT knob and select the BOTTOM HEATER mode by pressing the GRILL button twice. When the START button is pressed, the following operations occur:

Figure O-3(b) on page 31

1. The relay RY1 + RY4 + RY5 are energized.
2. The numbers of the digital readout start the count down to zero.
3. Then the bottom heating element, turntable motor, oven lamp and fan motor are energized.
4. Now, the food is grilled by the bottom heating element.
5. Upon completion of the selected cooking time, audible signal sounds and the contacts of relays RY1 + RY4 are opened, then the bottom heating elements, turntable motor and oven lamp are de-energized.
6. The relay RY5 stays closed for five (5) minutes, and the fan motor operates.

TOP AND BOTTOM MODE

In this mode, the food is cooked by both the grill heating elements (top grill) and bottom heating element. Enter the cooking time by rotating the TIME/WEIGHT knob and select the TOP AND BOTTOM mode by pressing the GRILL button three times. When the START button is pressed, the following operations occur:

Figure O-3(c) on page 31

1. The relay RY1 + RY3 + RY4 + RY5 are energized.
2. The numbers of the digital readout start the count down to zero.
3. Then the grill heating elements (top), bottom heating element, turntable motor, oven lamp and fan motor are energized.
4. Now, the food is grilled by the grill heating elements (top) and the bottom heating element.
5. Upon completion of the selected cooking time, audible signal sounds and the contacts of relays RY1 + RY3 +

RY4 are opened, then the grill heating elements (top), bottom heating element, turntable motor and oven lamp are de-energized.

6. The relay RY5 stays closed for five (5) minutes, and the fan motor operates.

DUAL COOKING CONDITION

The oven has two dual cooking mode. One is MICRO-WAVE AND TOP GRILL mode and other one is MICRO-WAVE AND BOTTOM HEATER mode. In both modes, the relay RY2 operates intermittently with in a 48 seconds time base as shown below.

Power level	ON time	OFF time
100%	48 sec.	0 sec.
70%	36 sec.	12 sec
50%	26 sec.	22 sec.
30%	16 sec.	32 sec
10%	8 sec.	40 sec

Power level 0% can not be programmed in Dual Cooking condition.

MICROWAVE AND TOP GRILL MODE

In this mode, the food is cooked by microwave and the grill heating elements (top). Enter the cooking time by rotating the TIME/WEIGHT knob and select the MICROWAVE AND TOP GRILL mode by pressing the DUAL cooking button once. And select the power level by pressing the MICROWAVE power button. When the START button is pressed, the following operations occur:

1. The relay RY1 + RY2 + RY3 + RY5 are energized.
2. The numbers of the digital readout start the count down to zero.
3. The grill heating element (top), high voltage transformer, turntable motor, oven lamp and fan motor are energized.
4. Now, the food is cooked by the microwave and grill heating element (top).
5. Upon completion of the selected cooking time, audible signal sounds and the contacts of relays RY1 + RY2 + RY3 are opened, then the grill heating element (top), high voltage transformer, turntable motor and oven lamp are de-energized.
6. The relay RY5 stays closed for five (5) minutes, and the fan motor operates.

MICROWAVE AND BOTTOM HEATER MODE

In this mode, the food is cooked by microwave and the bottom heating element. Enter the cooking time by rotating the TIME/WEIGHT knob and select the MICROWAVE AND BOTTOM HEATER mode by pressing the DUAL cooking button twice. And select the power level by pressing the MICROWAVE power button. When the START button is pressed, the following operations occur:

1. The relay RY1 + RY2 + RY4 + RY5 are energized.
2. The numbers of the digital readout start the count down to zero.
3. The bottom heating element, high voltage transformer, turntable motor, oven lamp and fan motor are energized.
4. Now, the food is cooked by the microwave and bottom heating element.
5. Upon completion of the selected cooking time, audible signal sounds and the contacts of relays RY1 + RY2 + RY4 are opened, then the bottom heating elements, high voltage transformer, turntable motor and oven lamp are de-energized.

- The relay **RY5** stays closed for five (5) minutes, and the fan motor operates.

SNACK/ PIZZA COOKING

SNACK/PIZZA automatically works out the correct cooking mode and time for cooking. Choose menu and enter the weight of the food with the weight entry touch pad. Once the oven starts, it will cook according to the special cooking sequence.

AUTO COOKING

AUTO COOK automatically works out the correct cooking mode and time for cooking. Choose menu and enter the weight of the food with the weight entry touch pad. Once the oven starts, it will cook according to the special cooking sequence.

AUTO DEFROST

AUTO DEFROST automatically works out the correct microwave power and time for defrosting. Choose menu and enter the weight of the food with the weight entry touch pad. Once the oven starts, it will cook according to the special cooking sequence.

LIMITATIONS OF POWER OUTPUT IN MANUAL OPERATION

After the same cooking mode is carried out for more than the specified cooking time, the power output is automatically reduced by turning the control relays on and off intermittently, as shown in the table below. This is to

protect the oven door against temperature rising.

Cooking mode	Specified cooking time (minutes)	Limited power output (%)	Time base (seconds)
Microwave	20	70	32
Top grill	30	50	48
Bottom heater	45	50	48
Top grill and Bottom heater	15 (Top)	50	48
	15 (Bottom)	50	48
DUAL	Micro. + Top grill heater	20 (Micro.)	70
		15 (Grill)	50
	Microwave + bottom heater	20 (Micro.)	70
		15 (Heater)	50

NOTE:

- In case of Automatic operations, the limitations of power output are not carried out.
- In case that the stop button is pressed or the oven door is opened during cooking, the limitations of power output are not carried out after the total cooking time beyond the specified cooking time.
- In case of the two or more same cooking modes are carried out, the limitations of power output are not carried out after the total cooking time beyond the specified cooking time.
- In case of the two or more different cooking modes are carried out, the specified cooking time is started to count from the point when the cooking mode is changed.
- If the cooking mode has the power level display, the power level is also displayed when the limitations of power output are carried out.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by pushing the open button on the control panel. When the open button is pushed, the open lever is moved upward, operating the latch head. The latch head is moved upward and released from the latch hook. Now, the door can be opened.

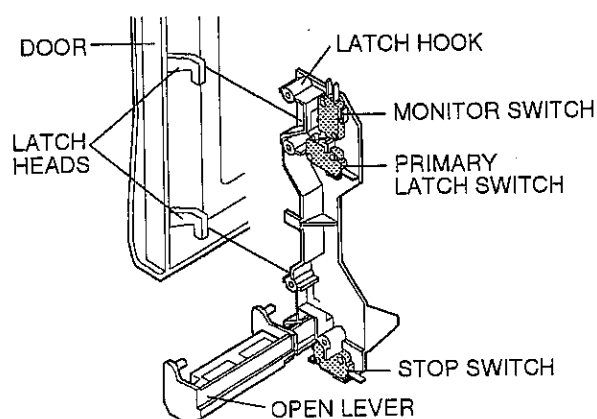


Figure D-1. Door Open Mechanism

PRIMARY LATCH SWITCH **SW1** AND STOP SWITCH **SW2**

- When the oven door is closed, the contacts (**COM-NO**) of each switch must be closed.
- When the oven door is opened, the contacts (**COM-**

NO) of each switch must be opened.

MONITOR SWITCH **SW3**

- When the door is closed, the contacts (**COM-NC**) must be opened and the contacts (**COM-NO**) must be closed.
- When the door is opened, the contacts (**COM-NC**) must be closed and the contacts (**COM-NO**) must be closed.
- If the oven door is opened and the contacts (**COM-NO**) of the primary latch switch **SW1** fail to open, the fuse **F1** T160mA blows immediately after closing the contacts (**COM-NC**) of the monitor switch **SW3**.

CAUTION: BEFORE REPLACING A BLOWN FUSE T160mA TEST THE PRIMARY LATCH SWITCH **SW1**, MONITOR SWITCH **SW3** AND MONITOR RESISTOR (MOUNTED NOISEFILTER) FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

FUSE **F1** T160mA

The fuse **F1** blows when the primary latch switch **SW1** remains closed with the oven door open and when the contacts (**COM-NC**) of monitor switch **SW3** closes.

SPECIAL FUSE **F2** 15A

If the wire harness or electrical components are short-

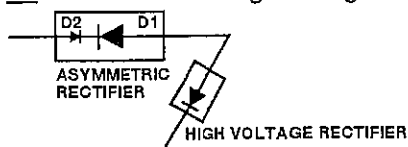
circuited, this fuse F2 blows to prevent an electric shock of fire hazard.

FUSE F3 F8A 250V

1. If the wire harness or electrical components are short-circuited, this fuse F3 blows to prevent an electric shock of fire hazard.
2. The fuse F3 also blows when asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of high voltage transformer is shorted.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is a solid state device that prevents current flow in both directions. And it prevents the temperature rise of the high voltage transformer by blowing the fuse F3 F8A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of blowing the fuse F3 F8A.)

1. The high voltage rectifier is shorted by any cause when microwave cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents beyond 8A flow through the primary winding of the high voltage transformer.
6. The fuse F3 blows by the large electric currents.
7. The power supply to the high voltage transformer is cut off.

THERMAL CUT-OUT TC1 125°C (MG)

This thermal cut-out protects the magnetron against over-

heating. If the temperature goes up higher than 125°C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out TC1 will open and line voltages to the high voltage transformer will be cut off and the operation of the magnetron will be stopped. The thermal cut-out will cut back in at 95°C.

THERMAL CUT-OUT TC2 150°C (OVEN)

The thermal cut-out located on the side of the air guide duct is designed to prevent damage to the oven if the foods in the oven catch fire due to over heating produced by improper setting of the cooking time or failure of control unit. Under the normal operation, the oven thermal cut-out TC2 remains closed. However, when abnormally high temperature are reached within the oven cavity, oven thermal cut-out TC2 will open at 150°C causing the oven to shut down. The thermal cut-out will cut back in at 120°C.

TURNTABLE MOTOR TTM

The turntable motor drives the turntable roller assembly to rotate the turntable.

FAN MOTOR FM

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from heating food. It is then exhausted through the exhausting air vents of the oven cavity.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

GRILL HEATING ELEMENT (TOP GRILL) GH1

The grill heating element GH1 is located on the top of the oven cavity assembly. The grill heating element GH1 sends out heat to grill foods.

BOTTOM HEATING ELEMENT GH2

The bottom heating element GH2 is located on the floor of the oven cavity assembly. The bottom heating element GH2 sends out heat to grill foods.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F1 (T160mA) in the primary latch switch - monitor switch - monitor resistor circuit, check the primary latch switch, monitor switch and monitor resistor (mounted on noise filter) before replacing the fuse F1 (T160mA).

TEST PROCEDURE		A	B	C	D	E	E	F	F	G	H	I	J	K	K	L	L							M	O	O	O	O	O	P	N	
CONDITION	PROBLEM	MAGNETRON	HIGH VOLTAGE TRANSFORMER	H.V. RECTIFIER ASSEMBLY	HIGH VOLTAGE CAPACITOR	PRIMARY LATCH SWITCH	MONITOR SWITCH	STOP SWITCH	THERMAL CUT-OUT 125°C	THERMAL CUT-OUT 150°C	FUSE 15A (F2)	FUSE T160mA (F1)	FUSE F8A (F3)	NOISE FILTER	FAN MOTOR	TURNABLE MOTOR	GRILL HEATING ELEMENT S(TOP)	BOTTOM HEATING ELEMENT	POWER SUPPLY CORD	OVEN LAMP OR SOCKET	SHORTED WIRE HARNESS	OPENED WIRE HARNESS	MIS-ADJUSTMENT OF SWITCHES	TOUCH CONTROL PANEL	RELAY RY1	RELAY RY2	RELAY RY3	RELAY RY4	RELAY RY5	FCIL PATTERN ON P.W.B.	KEY UNIT	
OFF CONDITION	Fuse E2 15A blows when power cord is plugged into wall outlet.											○		○							○											
	Fuse T160mA blows when the door is opened.					○	○					○											○									
	Oven lamp does not light when door is opened. (Display operates.)							○												○	○		○	○								
	Home fuse blows when power cord is plugged into wall outlet.																		○		○											
	"PRESS STOP" does not appear in display when power cord is plugged into wall outlet.									○	○	○	○		○				○			○	○							○		
	Display does not operate properly when STOP button is pressed.							○															○	○	○							
COOKING CONDITION (COMMON MODE)	Oven does not start when the START button is pressed. (Display operates.)							○														○	○	○	○							
	Oven lamp does not light. (Turntable motor operates.)																			○		○										
	Fan motor does not operate. (Oven lamp lights.)														○							○								○		
	Turntable motor does not operate. (Oven lamp lights.)					○											○					○	○									
	Oven or electrical parts does not stop when cooking time is 0 or STOP button is pressed.																							○	○	○	○	○	○			
	Oven goes into cook cycle but shuts down before end of cooking cycle.									○	○				○																	
MICROWAVE COOKING CONDITION	Oven seems to be operating but little or no heat is produced in oven load.	○	○	○	○		○							○									○	○	○		○					
	Oven does not operating properly during variable cooking condition except 100% cooking condition.																							○			○					
	Oven goes into cook cycle but shuts down before end of cooking cycle.									○						○																
GRILL COOKING CONDITION	Grill heating element (top) does operate.					○												○					○	○				○				
	Bottom heating element does operate.					○													○				○	○	○				○			
DUAL COOKING CONDITION	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power does not seem to be generated properly.)	○	○	○	○		○							○									○	○	○		○					
	Grill heating element (top) does operate.																	○					○	○				○				
	Bottom heating element does operate.																		○				○	○	○				○			

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	MAGNETRON TEST <div>NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.</div> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.</p> <p>To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.</p> <p>To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.</p> <p>MICROWAVE OUTPUT POWER (IEC-705-1988)</p> <p>The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it is measured by how much power the water load can absorb. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately $P \times t / 4.187$ calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT ($^{\circ}\text{C}$) during this microwave heating period, the calorie of the water is $V \times \Delta T$.</p> <div>The formula is as follows; $P \times t / 4.187 = V \times \Delta T$ $P \text{ (W)} = 4.187 \times V \times \Delta T / t$ Our condition for water load is as follows: Room temperature around 20°C Power supply Voltage Rated voltage Water load 1000 g Initial temperature $10 \pm 2^{\circ}\text{C}$ Heating time 47 sec. $P = 90 \times \Delta T$</div> <p>Measuring condition:</p> <ol style="list-style-type: none">1. Container The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.2. Temperature of the oven and vessel The oven and the empty vessel are at ambient temperature prior to the start the test.3. Temperature of the water The initial temperature of the water is $(10 \pm 2)^{\circ}\text{C}$.4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.6. The graduation of the thermometer must be scaled by 0.1°C at minimum and be an accurate thermometer.7. The water load must be (1000 ± 5) g.8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included. <p>NOTE: The operation time of the microwave oven is "t + 3" sec. (3 sec. is magnetron filament heat-up time.) Therefore total heating time = 50 sec.</p> <p>Measuring method:</p> <ol style="list-style-type: none">1. Measure the initial temperature of the water before the water is added to the vessel. (Example: The initial temperature $T_1 = 11^{\circ}\text{C}$)2. Add the 1 litre water to the vessel.3. Place the load on the centre of the shelf.4. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of (10 ± 2) K.5. Stir the water to equalize temperature throughout the vessel.6. Measure the final water temperature. (Example: The final temperature $T_2 = 21^{\circ}\text{C}$)7. Calculate the microwave power output P in watts from above formula.

TEST PROCEDURES (CONT'D)

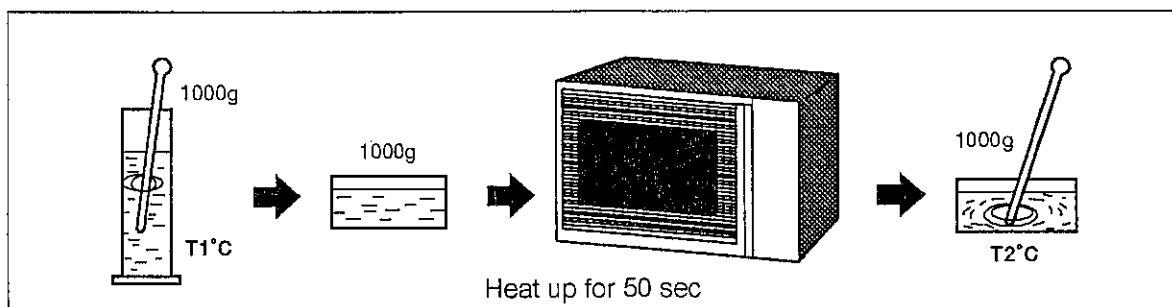
PROCEDURE LETTER

COMPONENT TEST

Initial temperature $T_1 = 11^\circ\text{C}$
 Temperature after $(47 + 3) = 50$ sec $T_2 = 21^\circ\text{C}$
 Temperature difference Cold-Warm $\Delta T = 10^\circ\text{C}$
 Measured output power
 The equation is " $P = 90 \times \Delta T$ " $P = 90 \times 10^\circ\text{C} = 900$ Watts

JUDGMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 90 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B HIGH VOLTAGE TRANSFORMER TEST

WARNING: High voltage and large currents are present at the secondary winding and filament winding of the high voltage transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three winding. The following readings should be obtained:-

- a. Primary winding approximately $1.9\ \Omega$
- b. Secondary winding approximately $96\ \Omega$
- c. Filament winding less than $1\ \Omega$

If the readings obtained are not stated as above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

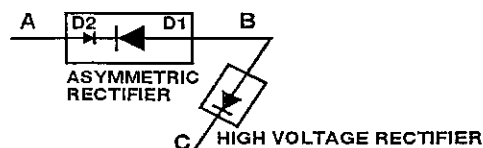
CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than $100\ \text{k}\Omega$ in the other direction.

CARRY OUT 4R CHECKS.

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.



Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both direction then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the high voltage transformer is shorted.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

COMPONENT TEST

CARRY OUT 4R CHECKS.

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS.

- A. Isolate the high voltage capacitor from the circuit.
- B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
- D. A short-circuited capacitor shows continuity all the time.
- E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
- F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
- G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

E SWITCH TEST

CARRY OUT 3D CHECKS.

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	Open circuit	Short circuit
Depressed	Short circuit	Open circuit

COM; Common terminal,
NO; Normally open terminal
NC; Normally close terminal

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

F THERMAL CUT-OUT TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

Table: Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit). (°C)	Indication of ohmmeter (When room temperature is approx. 20°C.)
Thermal cut-out 125°C	Cuts back in at 95°C.	Above 125°C	Closed circuit
Thermal cut-out 150°C	Cuts back in at 120°C.	Above 150°C	Closed circuit

If incorrect readings are obtained, replace the thermal cut-out.

An open circuit thermal cut-out TC1 (MG) indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure or a fault condition within the magnetron or HV. circuit.

An open circuit thermal cut-out TC2 (OVEN) indicates that the food in the oven cavity may catch fire, this may be due to over heating produced by improper setting of the cooking timer or failure of the control panel.

CARRY OUT 4R CHECKS.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST								
G	<p><u>BLOWN FUSE 15A (F2)</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>If the fuse 15A is blown, there could be a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p> <p>CAUTION: Only replace fuse 15A with the correct value replacement.</p>								
H	<p><u>BLOWN FUSE T160mA (F1)</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>If the fuse T160mA (F1) is blown when the door is opened, check the primary latch switch, monitor switch and monitor resistor.</p> <p>If the fuse T160mA (F1) is blown by incorrect door switching replace the defective switch(es) and the fuse T160mA (F1).</p> <p>CARRY OUT <u>4R</u> CHECKS.</p> <p>CAUTION: Only replace fuse with the correct value replacement.</p>								
I	<p><u>BLOWN FUSE F8A (F3)</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>If the fuse F8A (F3) is blown, there could be a short in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may be occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p> <p>CAUTION: Only replace fuse with the correct value replacement.</p>								
J	<p><u>NOISE FILTER TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Disconnect the leads from the terminals of noise filter. Using an ohmmeter, check between the terminals as described in the following table.</p> <div data-bbox="1050 1167 1453 1350"> </div> <table border="1"> <thead> <tr> <th>MEASURING POINTS</th><th>INDICATION OF OHMMETER</th></tr> </thead> <tbody> <tr> <td>Between N and L</td><td>Approx. 680 kΩ</td></tr> <tr> <td>Between terminal N and WHITE</td><td>Short circuit</td></tr> <tr> <td>Between terminal L and RED</td><td>Short circuit</td></tr> </tbody> </table> <p>If incorrect readings are absorbed, replace the noise filter unit.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>	MEASURING POINTS	INDICATION OF OHMMETER	Between N and L	Approx. 680 kΩ	Between terminal N and WHITE	Short circuit	Between terminal L and RED	Short circuit
MEASURING POINTS	INDICATION OF OHMMETER								
Between N and L	Approx. 680 kΩ								
Between terminal N and WHITE	Short circuit								
Between terminal L and RED	Short circuit								
K	<p><u>MOTOR WINDING TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.</p> <p>Table: Resistance of Motor</p> <table border="1"> <thead> <tr> <th>Motors</th><th>Resistance</th></tr> </thead> <tbody> <tr> <td>Fan motor</td><td>Approximately 250 Ω</td></tr> <tr> <td>Turntable motor</td><td>Approximately 15.5 kΩ</td></tr> </tbody> </table> <p>If incorrect readings are obtained, replace the motor.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>	Motors	Resistance	Fan motor	Approximately 250 Ω	Turntable motor	Approximately 15.5 kΩ		
Motors	Resistance								
Fan motor	Approximately 250 Ω								
Turntable motor	Approximately 15.5 kΩ								

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST						
L	<p><u>GRILL HEATING ELEMENT (TOP) AND BOTTOM HEATING ELEMENT TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Before carrying out the following tests make sure the heating element is cool completely.</p> <ol style="list-style-type: none"> 1. <u>Resistance of heating element.</u> Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the following table. <p style="text-align: center;">Table: Resistance of heating element</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Parts name</th><th style="text-align: center;">Resistance</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">Grill heating element (top)</td><td style="text-align: center;">Approximately $22.5 \Omega \times 2 = 45 \Omega$</td></tr> <tr> <td style="text-align: center;">Bottom heating element</td><td style="text-align: center;">Approximately 66Ω</td></tr> </tbody> </table> <ol style="list-style-type: none"> 2. <u>Insulation resistance.</u> Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element terminal and cavity using a 500V - 100MΩ insulation tester. The insulation resistance should be more than 10 MΩ in the cold start. <p>If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>	Parts name	Resistance	Grill heating element (top)	Approximately $22.5 \Omega \times 2 = 45 \Omega$	Bottom heating element	Approximately 66Ω
Parts name	Resistance						
Grill heating element (top)	Approximately $22.5 \Omega \times 2 = 45 \Omega$						
Bottom heating element	Approximately 66Ω						
M	<p><u>TOUCH CONTROL PANEL ASSEMBLY TEST</u></p> <p>The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance can not be performed with only a voltmeter and ohmmeter.</p> <p>In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and troubleshooting by replacement is described according to the symptoms indicated.</p> <ol style="list-style-type: none"> 1. Key Unit Note : Check key unit ribbon connection before replacement. The following symptoms indicate a defective key unit. Replace the key unit. <ol style="list-style-type: none"> a) When touching the pads, a certain pad produces no signal at all. b) When touching a number pad, two figures or more are displayed. c) When touching the pads, sometimes a pad produces no signal. 2. Control Panel The following symptoms indicate a defective control unit. Before replacing the control unit, perform the key unit test (Procedure N) to determine if control unit is faulty. <ol style="list-style-type: none"> 2-1 In connection with pads <ol style="list-style-type: none"> a) When touching the pads, a certain group of pads do not produce a signal. b) When touching the pads, no pads produce a signal. 2-2 In connection with indicators <ol style="list-style-type: none"> a) At a certain digit, all or some segments do not light up. b) At a certain digit, brightness is low. c) Only one indicator does not light up. d) The corresponding segments of all digits do not light up; or they continue to light up. e) Wrong figure appears. f) A certain group of indicators do not light up. g) The figure of all digits flicker. 2-3 Other possible troubles caused by defective control unit. <ol style="list-style-type: none"> a) Buzzer does not sound or continues to sound. b) Clock does not operate properly. c) Cooking is not possible. 						
N	<p><u>KEY UNIT TEST</u></p> <p>If the display fails to clear when the STOP pad is depressed, first verify the flat ribbon is marking good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connector). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP pad marking momentary contact. If the control unit responds by</p>						

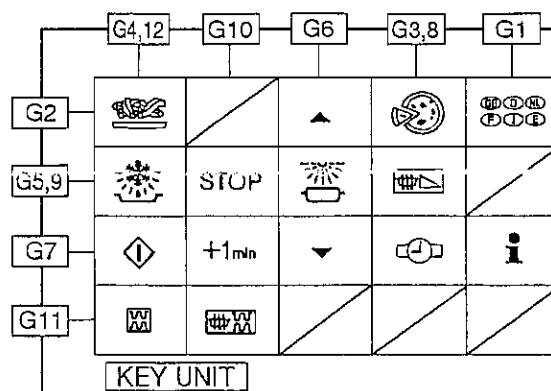
TEST PROCEDURES (CONT'D)

PROCEDURE
LETTER

COMPONENT TEST

clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.

CARRY OUT 4R CHECKS.



O

RELAY TEST

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 1 and 3 of the 4 pin connector (A) on the control unit with an A.C. voltmeter.

The meter should indicate 230 volts, if not check oven circuit.

Relay Test

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation, convection cooking operation or grill operation.

DC. voltage indicated Defective relay.

DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 24.0V D.C.	Oven lamp / Turntable motor
RY2	Approx. 18.0V D.C.	High voltage transformer
RY3	Approx. 18.0V D.C.	Grill heating element (Top grill)
RY4	Approx. 18.0V D.C.	Bottom heating element
RY5	Approx. 24.0V D.C.	Fan motor

CARRY OUT 4R CHECKS.

P

PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) OPEN

To protect the electronic circuits, this model is provided with a fine foil pattern added to the input circuit on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present at Power terminal of CPU connector (CN-A).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)

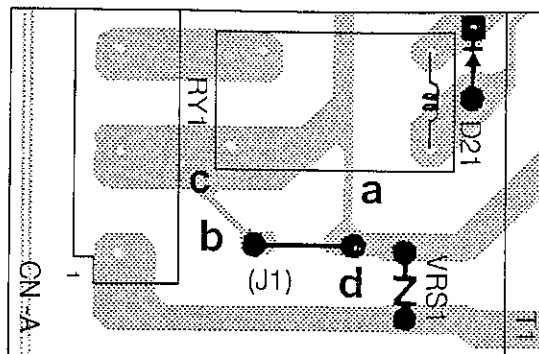
TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

COMPONENT TEST

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.

CARRY OUT 4R CHECKS.



TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Key Unit
- (2) Control Unit

The principal functions of these units and signals communicated among them are explained below.

Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through P23 - P27. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P74 - P77 to perform the function that was requested.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, temperature measurement circuit, indicator circuit, encoder circuit, and back light circuit.

1) LSI

This LSI controls the key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit

This circuit generates voltage necessary in the control unit.

Symbol	Voltage	Application
VC	-5.2V	LSI(IC1)

3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL

A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6) Door Sensing Switch (Stop Switch)

A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit

To drive the magnetron, heating element, fan motor, turntable motor and light the oven lamp.

8) Encoder

The encoder converts the signal generated by LSI into the pulse signal, and the pulse signal is returned to the LSI.

9) Back Light Circuit

A circuit to drive the back light (Light emitting diodes LD1 - LD5).

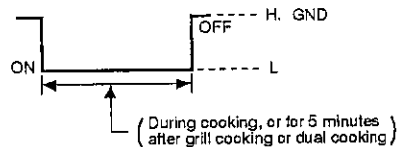
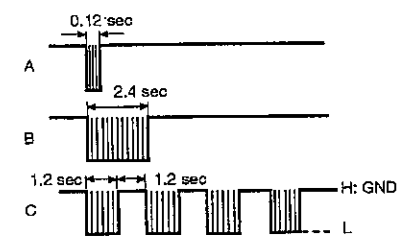

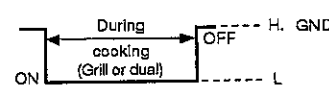
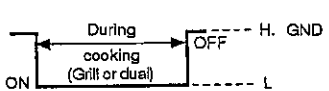
10) Indicator Circuit


This circuit consists of 4-digits, 30-segments and 3-common electrodes using a Liquid Crystal Display.

DESCRIPTION OF LSI

LSI(IZA705DR)

The I/O signal of the LSI(IZA705DR) are detailed in the following table:

Pin No.	Signal	I/O	Description																																										
1	C1	IN	Terminal not used.																																										
2	VL1	IN	Power source voltage input terminal. Standard voltage for LCD.																																										
3-6	AN7-AN4	IN	Terminal to change constant cooking.																																										
7	AN3	IN	Terminal not used.																																										
8	AN2	IN	Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal. Door opened; "L" level signal.																																										
9-10	AN1-AN0	IN	Terminal not used.																																										
11-12	P57-P56	IN/OUT	Terminal not used.																																										
13	P55	OUT	Fan motor driving signal. To turn on and off the fan motor relay RY5. "L" level during cooking, or for 5 minutes after grill cooking or dual cooking. "H" level otherwise. 																																										
14	CNTR0	OUT	Signal to sound buzzer. A: key touch sound. B: Completion sound. C: When the temperature of the oven cavity reaches the preset temperature in the preheating mode, or when the preheating hold time (30 minutes) is elapsed. 																																										
15	P53	OUT	Oven lamp and turntable motor driving signal(Square Waveform : 50Hz). To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit and relays (RY2,RY3,RY4) control circuit. 																																										
16	P52	OUT	Bottom heating element driving signal. To turn on and off the bottom element relay (RY4). "L" level during grill (BOTTOM HEATER, TOP AND BOTTOM) cooking or dual (Dual 2) cooking; "H" level otherwise. 																																										
17	P51	OUT	Grill heating element (TOP GRILL)driving signal. To turn on and off the grill heating element relay (RY3). "L" level during grill (TOP GRILL, TOP AND BOTTOM) cooking or dual (Dual 1) cooking; "H" level otherwise. 																																										
18	P50	OUT	Magnetron high-voltage circuit driving signal. To turn on and off the cook relay (RY2). In 100% POWER operation, the signals hold "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (70%, 50%, 30%, 10%) the signal turns to "H" level and "L" level in repetition according to the power level. <table data-bbox="979 1599 1522 1899"><tr><th colspan="3">ON/OFF time ratio in Micro cooking (a. 32second time base)</th><th colspan="3">ON/OFF time ratio in Micro cooking (a. 48second time base)</th></tr><tr><th>MICRO COOK</th><th>ON</th><th>OFF</th><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr><tr><td>100%</td><td>32sec.</td><td>0sec.</td><td>100%</td><td>48sec.</td><td>0sec.</td></tr><tr><td>70%</td><td>24sec.</td><td>8sec.</td><td>70%</td><td>36sec.</td><td>12sec.</td></tr><tr><td>50%</td><td>18sec.</td><td>14sec.</td><td>50%</td><td>26sec.</td><td>22sec.</td></tr><tr><td>30%</td><td>12sec.</td><td>20sec.</td><td>30%</td><td>16sec.</td><td>32sec.</td></tr><tr><td>10%</td><td>6sec.</td><td>26sec.</td><td>10%</td><td>8sec.</td><td>40sec.</td></tr></table>	ON/OFF time ratio in Micro cooking (a. 32second time base)			ON/OFF time ratio in Micro cooking (a. 48second time base)			MICRO COOK	ON	OFF	MICRO COOK	ON	OFF	100%	32sec.	0sec.	100%	48sec.	0sec.	70%	24sec.	8sec.	70%	36sec.	12sec.	50%	18sec.	14sec.	50%	26sec.	22sec.	30%	12sec.	20sec.	30%	16sec.	32sec.	10%	6sec.	26sec.	10%	8sec.	40sec.
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19-20	P47-P46	IN/OUT	Terminal not used.																																										
21	P45	OUT	Back light driving signal. To change the brightness of the back light (Light emitting diodes LD1 - LD5). The square waveform voltage is delivered to the back light driving circuit.																																										
22	P44	IN/OUT	Terminal not used.																																										

Pin No.	Signal	I/O	Description
23	INT1	IN	Signal coming from encoder. When the encoder is turned, the contacts of encoder make pulse signals. And pulse signals are input into INT1.
24	INT0	IN	Signal to synchronized LSI with commercial power source frequency(50Hz). This is basic timing for time processing of LSI. 
25	P41	IN	Signal coming from encoder. Signal similar to INT1. Pulse signals are input into P41.
26	P40	IN/OUT	Terminal not used.
27	P77	IN	Signal coming from touch key. When any one of G11 line keys on key matrix is touched, a corresponding signal from P23 - P27 will be input into P77. When no key is touched, the signal is held at "L" level.
28	P76	IN	Signal similar to P77. When any one of G7 line keys on key matrix is touched, a corresponding signal will be input into P76.
29	P75	IN	Signal similar to P77. When any one of G5 and G9 line keys on key matrix is touched, a corresponding signal will be input into P75.
30	P74	IN	Signal similar to P77. When any one of G2 line keys on key matrix is touched, a corresponding signal will be input into P74.
31-33	P73-P71	IN/OUT	Terminal not used.
34	P70	IN	Connected to VC.
35	RESET	IN	Auto clear terminal. Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.
36	XCIN	IN	Terminal not used.
37	XCOUT	OUT	Terminal not used.
38	XIN	IN	Internal clock oscillation frequency input setting. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XIN terminal.
39	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XOUT.
40	VSS	IN	Power source voltage: -5V VC voltage of power source circuit input.
41	P27	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P74 - P77 terminal while one of G4 and G12 line keys on matrix is touched.
42	P26	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P74 - P77 terminal while one of G10 line keys on matrix is touched.
43	P25	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P74 - P77 terminal while one of G6 line keys on matrix is touched.
44	P24	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P74 - P77 terminal while one of G3 and G8 line keys on matrix is touched.
45	P23	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P74 - P77 terminal while one of G1 line keys on matrix is touched.
46-48	P22-P20	IN/OUT	Terminal not used.
49-50	P17-P16	IN/OUT	Terminal not used.

Pin No.	Signal	I/O	Description																																																																
51	SEG39	OUT	Terminal not used.																																																																
60	SEG30																																																																		
61	SEG29	OUT	Segment data signal. Connected to LCD. The relation between signals are as follows:																																																																
90	SEG 0		<table> <thead> <tr> <th>LSI signal (Pin No.)</th><th>LCD (Pin No.)</th><th>LSI signal (Pin No.)</th><th>LCD (Pin No.)</th></tr> </thead> <tbody> <tr> <td>SEG 0 (90).....</td><td>1</td><td>SEG15 (75).....</td><td>29</td></tr> <tr> <td>SEG 1 (89).....</td><td>2</td><td>SEG16 (74).....</td><td>28</td></tr> <tr> <td>SEG 2 (88).....</td><td>3</td><td>SEG17 (73).....</td><td>27</td></tr> <tr> <td>SEG 3 (87).....</td><td>4</td><td>SEG18 (72).....</td><td>26</td></tr> <tr> <td>SEG 4 (86).....</td><td>5</td><td>SEG19 (71).....</td><td>25</td></tr> <tr> <td>SEG 5 (85).....</td><td>6</td><td>SEG20 (70).....</td><td>24</td></tr> <tr> <td>SEG 6 (84).....</td><td>7</td><td>SEG21 (69).....</td><td>11</td></tr> <tr> <td>SEG 7 (83).....</td><td>8</td><td>SEG22 (68).....</td><td>23</td></tr> <tr> <td>SEG 8 (82).....</td><td>9</td><td>SEG23 (67).....</td><td>22</td></tr> <tr> <td>SEG 9 (81).....</td><td>10</td><td>SEG24 (66).....</td><td>12</td></tr> <tr> <td>SEG10 (80).....</td><td>34</td><td>SEG25 (65).....</td><td>13</td></tr> <tr> <td>SEG11 (79).....</td><td>33</td><td>SEG26 (64).....</td><td>14</td></tr> <tr> <td>SEG12 (78).....</td><td>32</td><td>SEG27 (63).....</td><td>15</td></tr> <tr> <td>SEG13 (77).....</td><td>31</td><td>SEG28 (62).....</td><td>16</td></tr> <tr> <td>SEG14 (76).....</td><td>30</td><td>SEG29 (61).....</td><td>17</td></tr> </tbody> </table>	LSI signal (Pin No.)	LCD (Pin No.)	LSI signal (Pin No.)	LCD (Pin No.)	SEG 0 (90).....	1	SEG15 (75).....	29	SEG 1 (89).....	2	SEG16 (74).....	28	SEG 2 (88).....	3	SEG17 (73).....	27	SEG 3 (87).....	4	SEG18 (72).....	26	SEG 4 (86).....	5	SEG19 (71).....	25	SEG 5 (85).....	6	SEG20 (70).....	24	SEG 6 (84).....	7	SEG21 (69).....	11	SEG 7 (83).....	8	SEG22 (68).....	23	SEG 8 (82).....	9	SEG23 (67).....	22	SEG 9 (81).....	10	SEG24 (66).....	12	SEG10 (80).....	34	SEG25 (65).....	13	SEG11 (79).....	33	SEG26 (64).....	14	SEG12 (78).....	32	SEG27 (63).....	15	SEG13 (77).....	31	SEG28 (62).....	16	SEG14 (76).....	30	SEG29 (61).....	17
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92	VREF	IN	Connected to GND.																																																																
93	AVSS	IN	Connected to VC.																																																																
94	COM3	OUT	Common data signal: COM3. Connected to LCD (Pin No. 21).																																																																
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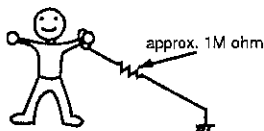
SERVICING

1. Precautions for Handling Electronic Components

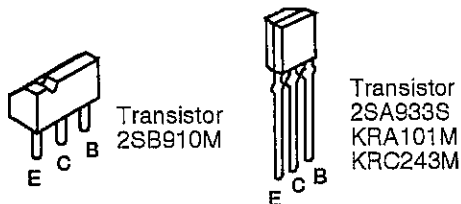
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so.

To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven :

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD .

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

- A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated.

For those models, check and repair all the

controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

- B. On some models, the power supply cord between the touch control panel and the oven proper is so long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if the dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
- 3) Others: Hand tools

5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. Disconnect oven from power supply.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).
1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal is damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back about 3 cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.

6. Discharge the H.V. capacitor before carrying out any further work.
 7. Do not operate the oven with the outer case removed.
- N.B.; Step 1, 2 and 6 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENT OR WIRING.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS.
2. Disconnect all the leads and terminals of high voltage rectifier assembly from the high voltage capacitor.
3. Remove one (1) screw holding earth side terminal of the high voltage rectifier assembly.
4. Remove one (1) screw holding capacitor holder to the oven cavity.
5. Release the capacitor holder from the duct.
6. Remove the capacitor from the capacitor holder.

7. Now, the high voltage rectifier assembly and the capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER AND BASE PLATE WITH AN EARTHING SCREW.

HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the filament leads of high voltage transformer from high voltage capacitor and the magnetron.
3. Disconnect the H.V. wire A from the high voltage transformer.
4. Disconnect the main wire harness from the high volt-

age transformer.

5. Remove the four (2) screws and one (1) washer holding the transformer to base plate.
6. Remove the transformer.
7. Now the high voltage transformer is free.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Release the tabs of air intake duct from the chassis support and the oven cavity.
3. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.

4. Remove the one (1) screw holding the chassis support to the magnetron.
5. Move the air intake duct to left.
6. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws hold the magnetron to prevent it from falling.

7. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

CONTROL PANEL ASSEMBLY REMOVAL

CONTROL UNIT

1. CARRY OUT 3D CHECKS.
2. Disconnect the main wire harness and the stop switch harness from the control unit.
3. Disconnect the flat ribbon cable from the connector G.
4. Remove the five (5) screws holding the control unit to the control panel.
5. Release the two (2) tabs holding the control unit to the control panel.
6. Remove the solder holding the liquid crystal display (LCD) to the control unit.
7. Remove the liquid crystal display from the LCD holder.
8. Now, the liquid crystal display and the LCD sheet are

free.

9. Release the two (2) tabs of the LCD holder from the control unit (main wiring board).
10. Release the two (2) tabs of the LCD holder from the control unit (LED wiring board).
11. Now, the LCD holder and the control unit are free.

T/C KEY ASSEMBLY

13. Remove the five (5) screws holding the T/C key assembly to the control panel.
14. Now, the T/C key assembly is free.

FAN MOTOR REPLACEMENT

REMOVAL

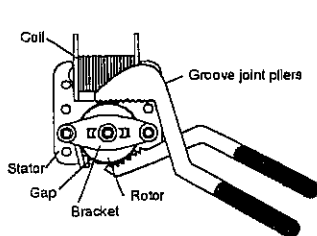
1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tab on the fan duct.
4. Disconnect the wire leads from the fan motor.
5. Remove the one (1) screw holding the capacitor holder to the oven cavity back plate.
6. Remove the one (1) screw holding the fan duct to the oven cavity back plate.
7. Release the tabs of the capacitor holder from fan duct.
8. Remove the fan duct from the oven.
9. Remove the fan blade from the fan motor shaft according to the following procedure.
 - 1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

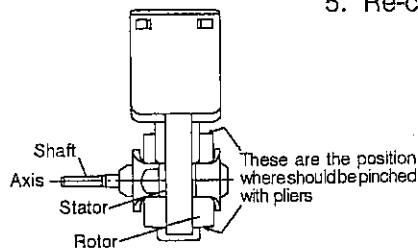
- Make sure that any pieces do not enter the gap between the rotor and the stator of the fan motor. Because the rotor is easy to be shaven by pliers and metal pieces may be produced.
 - Do not let the pliers touch the coil of the fan motor because the coil may be cut or damaged.
 - Do not distort the bracket by touching with the pliers.
- 2) Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
 - 3) Now, the fan blade will be free.

CAUTION:

- Do not use this removed fan blade again.



Rear view



Side view

Because the hole (for shaft) of it may become bigger than a standard one.

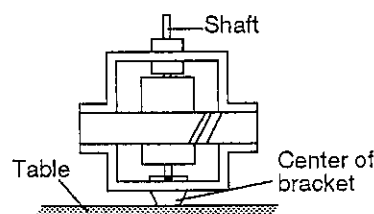
10. Remove the two (2) screws holding the fan motor to the fan duct.
11. Now, the fan motor is free.

INSTALLATION

1. Install the fan motor to the fan duct with the two (2) screws.
2. Install the fan blade to the fan motor shaft according to the following procedure.
 - 1) Hold the centre of the bracket which supports the shaft of the fan motor on a flat table.
 - 2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
 - 3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

CAUTION:

- Do not hit the fan blade when installing because the bracket may be deformed.
 - Make sure that the fan blade rotates smoothly after installation.
 - Make sure that the axis of the shaft is not slanted.
3. Install the fan duct to the oven cavity back plate with the one (1) screw.
 4. Insert the tabs of the capacitor holder to the fan duct.
 5. Install the capacitor holder to the oven cavity back plate with the one (1) screw.
 4. Install the noise filter to the fan duct and the chassis support with the one (1) screw.
 5. Re-connect the wire leads to the fan motor.



TURNTABLE MOTOR REPLACEMENT

1. Disconnect the oven from the power supply.
2. Remove the turntable motor cover by snipping of material in four corners.
3. Where the corners have been snipped off, bend corner areas flat. No sharp edge must be evident after removal of turntable motor cover.
4. Disconnect the wire leads from the turntable motor and remove the one (1) screw holding the turntable motor.
5. Now, the turntable motor is free.
6. After replacement use the one (1) screw provided with the turntable motor assembly to fit turntable motor cover.

OVEN LAMP REMOVAL

1. CARRY OUT 3D CHECKS.
2. To remove the wire from the lamp holder press down the terminal tab and pull.
3. Lift up the oven lamp.
4. Now, the oven lamp is free.

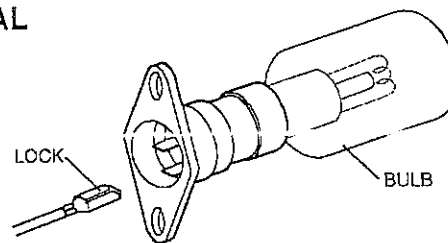


Figure C-1. Oven lamp

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the green/yellow wire to the cavity top plate.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-2(a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

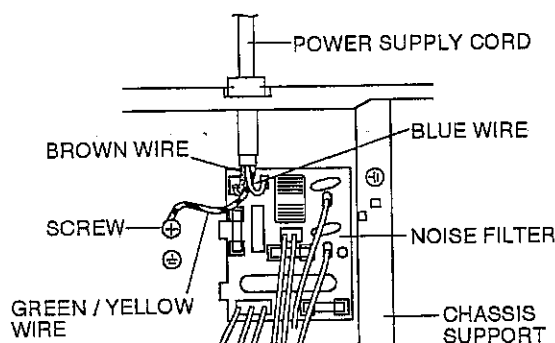


Figure C-2 (a) Replacement of Power Supply Cord

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-2(b).
2. Install the earth wire lead of power supply cord to the cavity top plate with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

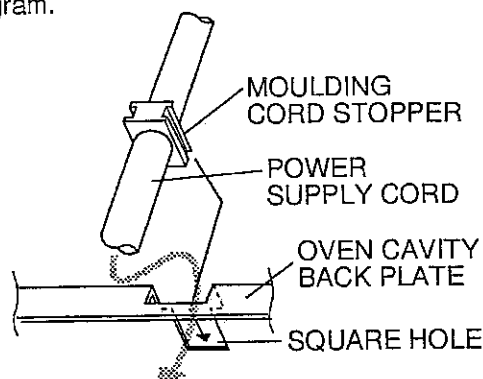


Figure C-2(b). Power Supply Cord Replacement

GRILL HEATING ELEMENT (TOP GRILL) REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the exhaust duct to the oven cavity.
2. Remove the exhaust duct from the oven cavity.
4. Disconnect the wire leads from the grill heating elements.
5. Lay down the two (2) tabs holding the heater reflector to the oven cavity.
6. Remove the heater reflector from the oven cavity by sliding it toward the magnetron.
7. Make the tabs of grill heater angle straight.
8. Remove the grill heater angle, grill heating elements and the short terminal together from the heater reflector.
9. Remove the grill heater angle from the grill heating elements.
10. Remove the two (2) screws holding the short terminal to the grill heating elements.
11. Now the individual grill heating elements are free.

BOTTOM HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the fan duct from the oven cavity, referring to "FAN MOTOR REPLACEMENT".
3. Disconnect the wire leads from the bottom heating element.
4. Release the heater spring from the earth angle.
5. Lift up the bottom heating element so that the screw head (which is holding the earth angle to the bottom heating element) can be seen from the hole of the base plate.

6. Insert the screw driver into the hole of the base plate and remove the one (1) screw holding earth angle to the bottom heating element.
7. Remove the earth angle from the bottom heating element.
8. Remove the two (2) nuts holding the bottom heating

element to the oven cavity right wall.

9. Remove the two (2) nuts holding the bottom heating element to the heater cover with the heat sealed spring at the oven cavity left wall.
10. Remove the bottom heating element from the oven cavity.

PRIMARY LATCH SWITCH, MONITOR SWITCH AND STOP SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL ASSEMBLY REMOVAL".
3. Disconnect the leads from all switches.
4. Remove the two (2) screws holding the latch hook to the oven cavity.
5. Remove the latch hook.
6. Push the retaining tab slightly and remove the switch.

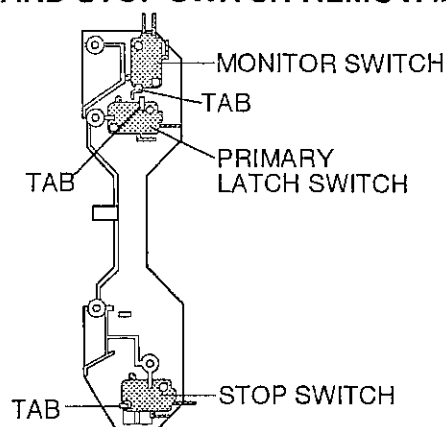


Figure C-3. Switches

PRIMARY LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the primary latch switch, stop switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS.
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With the door closed, adjust the latch hook by moving it back and forward or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the monitor switch has activated with the door closed. The vertical position of the latch hook should be placed where the primary latch switch and stop switch have activated with the door closed.
4. Secure the screws with washers firmly.
5. Make sure of the primary latch switch, stop switch and monitor switch operation. If those switches have not activated with the door closed, two (2) screw holding latch hook to oven cavity front flange and adjust the latch hook position.

results (play of the door) should be less than 0.5mm.

2. The contacts (COM-NO) of the primary latch switch and stop switch interrupt the circuit before the door can be opened.
3. The contacts (COM-NC) of the monitor switch close when the door is opened.
4. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

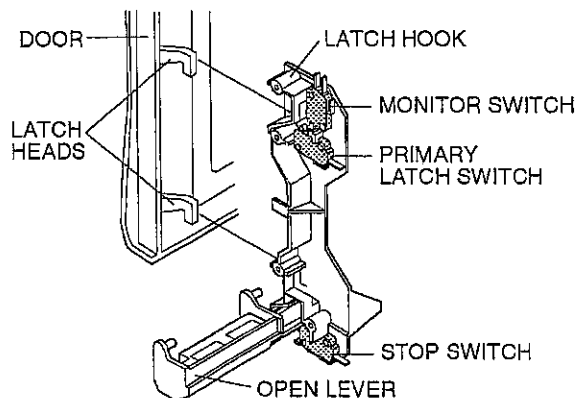


Figure C-4 Latch Switches Adjustment

After adjustment, make sure of following:

1. In and out play of door remains less than 0.5 mm when latched position. First check latch hook position, pushing and pulling the door toward the oven face. The

DOOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Push the open button and open the door slightly.
3. Insert an putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown

in Figure C-5 to free engaging parts.

4. Try the principles of the lever and lift up the choke cover by inserting a putty knife as shown in Figure C-5.
5. Release choke cover from door panel.
6. Now choke cover is free.

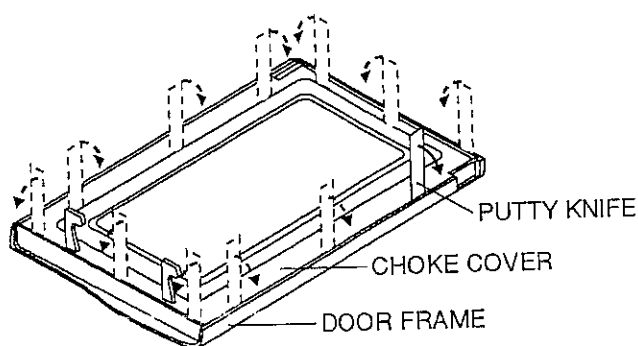


Figure C-5. Door Disassembly

6. Remove the Non-return washer from the lower pin.
7. Release two (2) pins of door panel from two (2) hole of upper and lower oven hinges by lifting up.
8. Now, door sub assembly is free from oven cavity.
9. Remove the four (4) screws holding the door panel to the door frame.
10. Release door panel from eight (8) tabs of door frame by sliding door panel downward.
11. Now, door panel is free.
12. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
13. Now, latch head and latch spring are free.
14. Remove the two (2) screws holding the glass stopper to the door frame.
15. Remove the glass stopper from the door frame.
16. Slide the front door glass leftwards and then slide upwards to release the tabs holding it.
17. Now, the front door glass is free

RE-INSTALL

1. Re-install the front door glass to the door frame as follows.
 - 1) Insert the upper edge of the front door glass into the six (6) tabs of the door frame.
 - 2) Slide the front door glass downwards and insert the lower edge of the front door glass into the six (6) tabs of the door frame.
 - 3) Slide the front door glass rightwards and insert the right edge of the front door glass into the one (1) tab of the door frame.
2. Re-install the glass stopper to the door frame as follows.
 - 1) Re-install the glass stopper to the door frame so that the two (2) holes of the glass stopper meet the two (2) pins of the door frame.
 - 2) Hold the glass stopper to the door frame with the two (2) screws.
3. Re-install the latch spring to the latch head. Re-install the latch spring to the door frame. Re-install latch head to door frame.
4. Re-install door panel to door frame by fitting eight (8) tabs of door frame to eight (8) holes of door panel.
5. Hold the door panel to the door frame with four (4) screws.
6. Catch two (2) pins of door panel on two (2) hole of upper and lower oven hinges.
7. Re-install choke cover to door panel by pushing.
8. Replace the Non-return washer (new).

Note: After any service to the door;

- (A) Make sure that door sensing switch and primary latch switch are operating properly. (Refer to chapter "Test Procedures").
- (B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards. (Refer to Microwave Measurement Procedure.)

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through centre of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves, indicate a leakage of microwave energy from oven cavity.

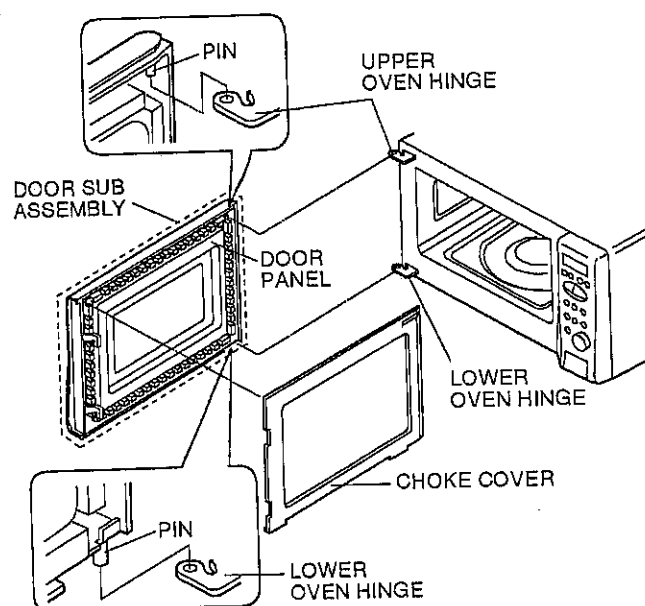


Figure C-6. Door Replacement

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of $5\text{mW}/\text{cm}^2$ at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

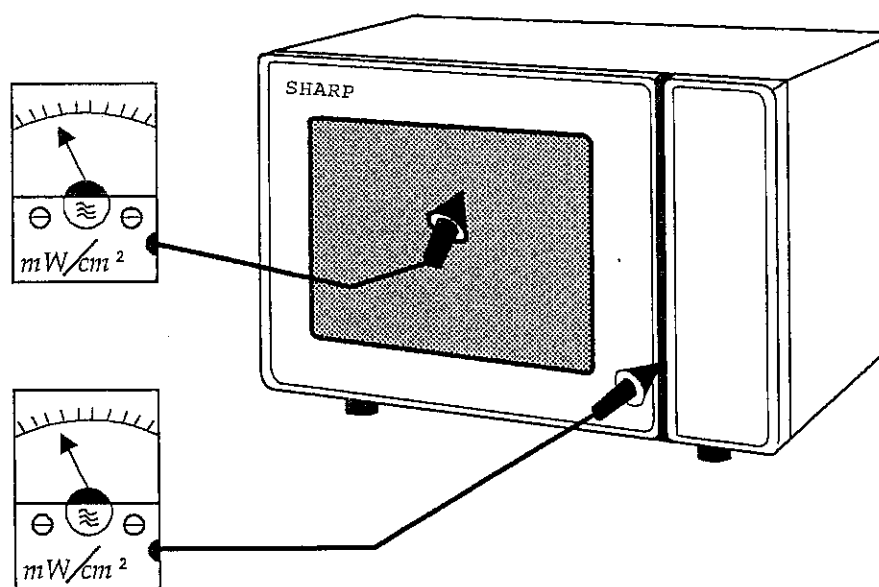
Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
Important:
Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

NARDA 8100
NARDA 8200
HOLADAY HI 1500
SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of $275 \pm 15\text{ml}$ of water initially at $20 \pm 5^\circ\text{C}$ in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster than 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

TEST DATA AT A GLANCE

Parts	Symbol	Value / Data
Fuse	F1	T160mA / 250V
Special fuse	F2	15A / 250V
Fuse	F3	F8A
Thermal cut-out (MG.)	TC1	125°C
Thermal cut-out (OVEN)	TC2	150°C
Grill heating element (top)	GH1	Approx. $22.5 \Omega \times 2 = 45 \Omega$ / Insulation resistance $> 10 \text{ M}\Omega$
Bottom heating element	GH2	Approx. 66Ω / Insulation resistance $> 10 \text{ M}\Omega$
Oven lamp	OL	230-240 V 25W
High voltage capacitor	C	AC 2100V 1.2 μ F
Magnetron	MG	Filament $< 1 \Omega$ / Filament - chassis $\infty \text{ ohm}$.
Power transformer	T	Filament winding $< 1 \Omega$ Secondary winding Approx. 96Ω / Primary winding Approx. 1.9Ω

TEST POINTS ON CONTROL UNIT

In/Out put terminal	Test Point	Volt	Resistance (Disconnect the power and door is closed)
Input terminal (Power supply)	A1 - A3	230V	Approx. 820Ω
Input terminal (Stop switch)	B1 - B2	-	0.2Ω
Output terminal (Grill heating element)	N.O. of RY3 - A1	230V	Approx. 46Ω
Output terminal (Bottom heating element)	N.O. of RY4 - A1	230V	Approx. 70Ω
Output terminal (Fan motor)	A1 - A7	230V	Approx. 243Ω
Output terminal (Oven lamp, Turntable motor)	A1 - A5	230V	Approx. 174Ω
Output terminal (Earth)	B2 - Chassis	-	0.2Ω
Output terminal (High voltage transformer)	N.O. of RY2 - A1	230V	Approx. 2Ω

WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. OR CLOCK APPEAR ON DISPLAY.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/15 : SECTIONAL AREA OF 1.5mm² MIN.
"★" Indicates components with potential above 250 V.

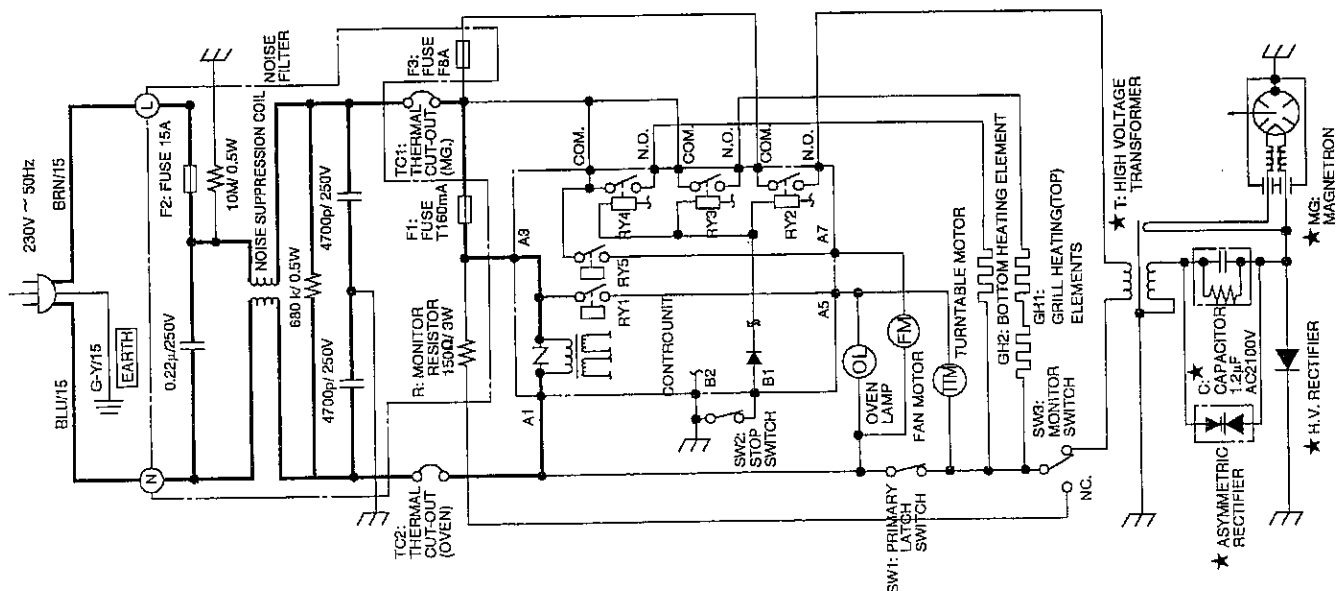


Figure O-1 Oven Schematic-OFF Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. MICROWAVE POWER BUTTON PRESSED ONCE(100%).
4. STRAT BUTTON PRESSED.

★ Indicates components with potential above 250 V.

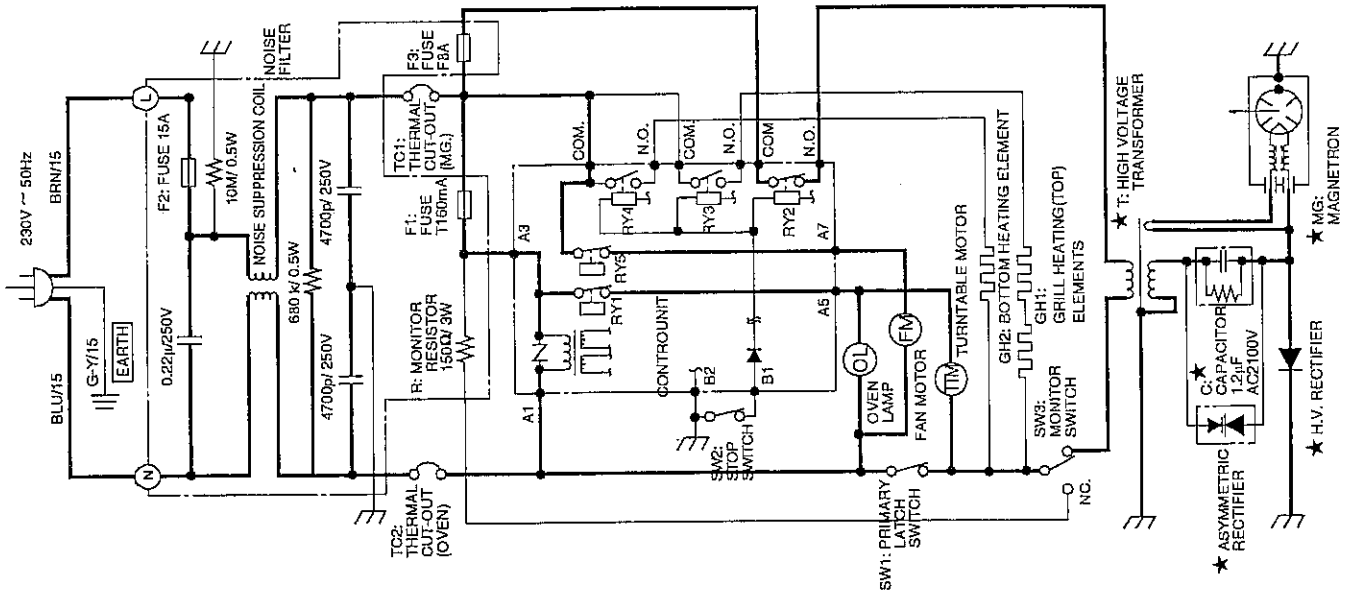


Figure O-2 Oven Schematic-Microwave cooking Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. GRILL BUTTON PRESSED ONCE.
4. STRAT BUTTON PRESSED.

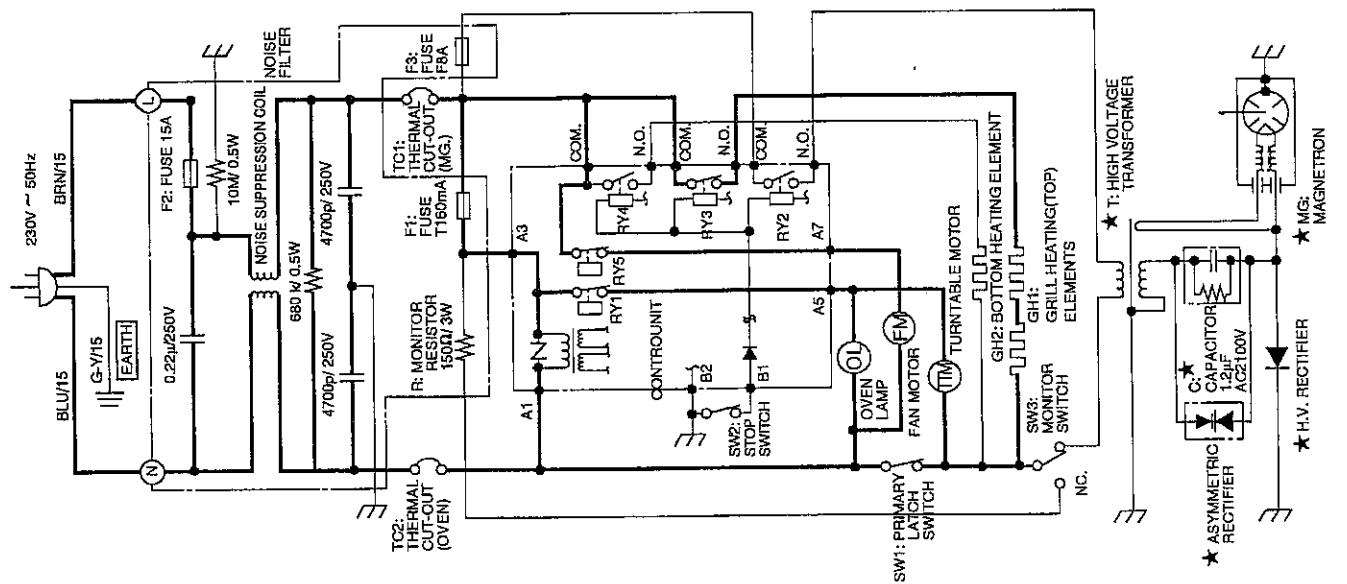


Figure O-3(a) Oven Schematic-Grill cooking Condition (TOP GRILL mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. GRILL BUTTON PRESSED TWICE.
4. STRAT BUTTON PRESSED.

★ Indicates components with potential above 250 V.

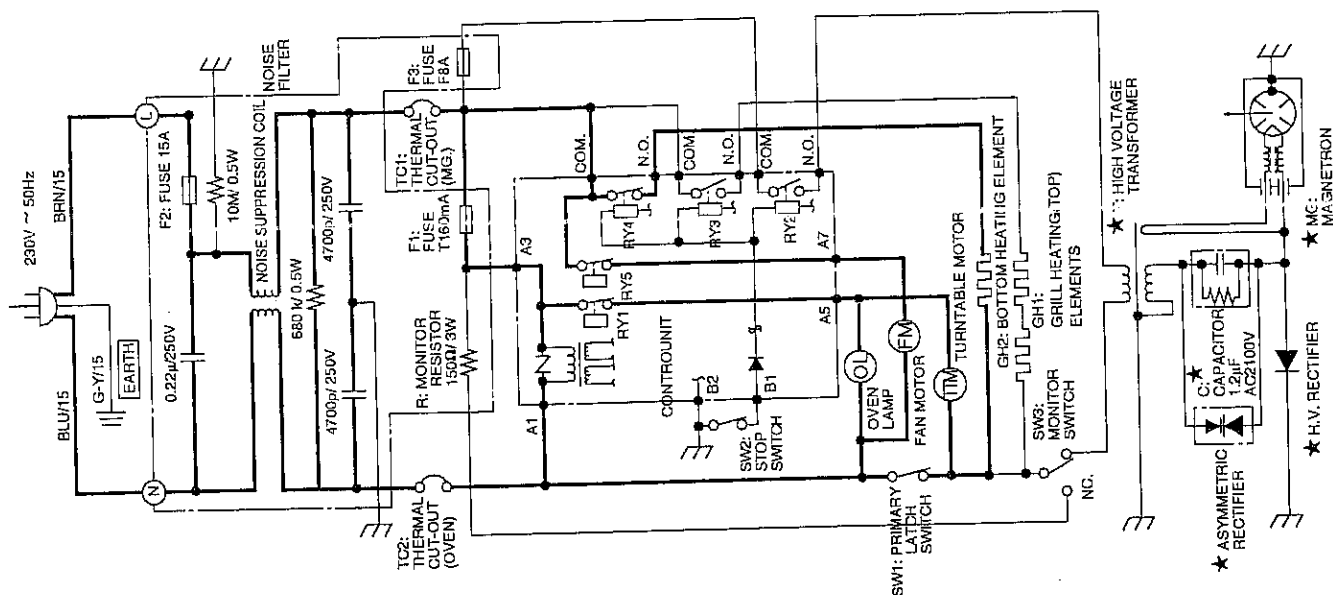


Figure O-3(b) Oven Schematic-Grill cooking Condition (BOTTOM HEATER mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. GRILL BUTTON PRESSED THREE TIMES.
4. STRAT KEY BUTTON PRESSED.

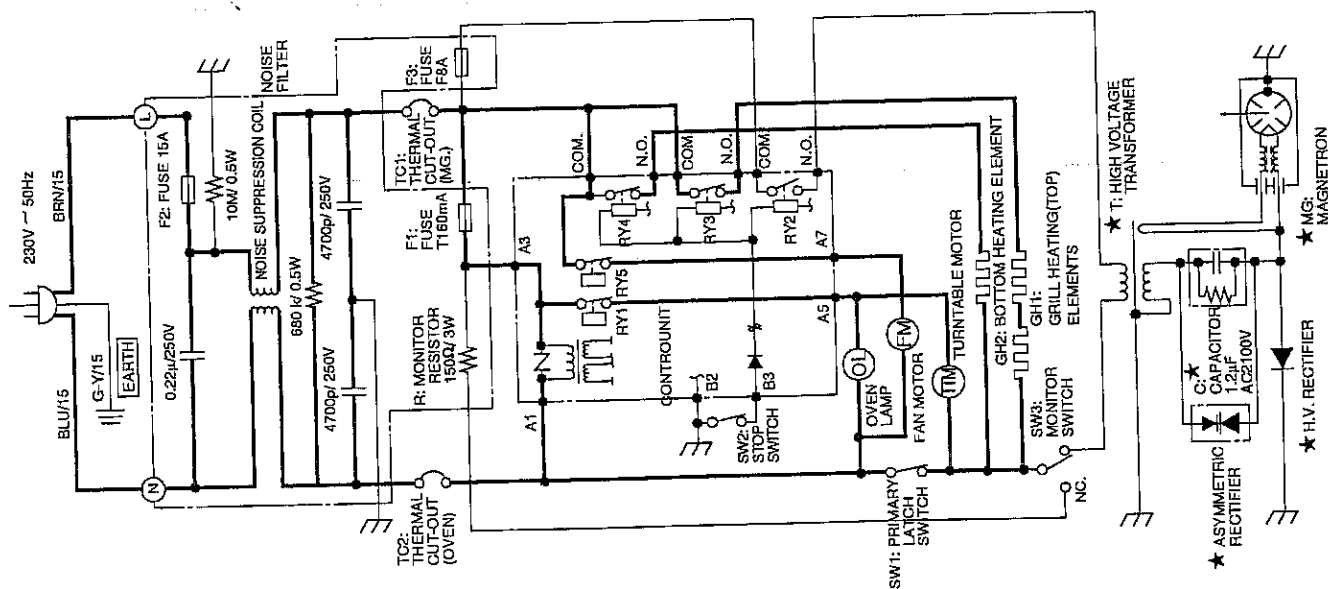


Figure O-3(c) Oven Schematic-Grill cooking Condition (TOP AND BOTTOM mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. DUAL COOKING BUTTON PRESSED ONCE.
4. STRAT KEY BUTTON PRESSED.

★ Indicates components with potential above 250 V.

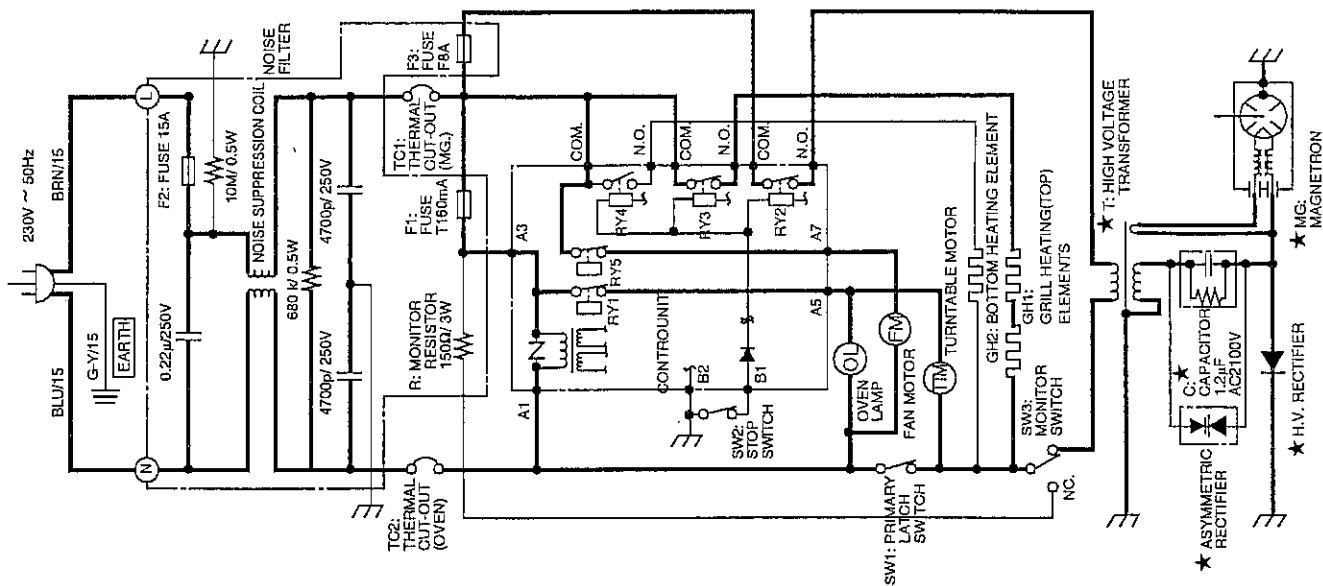


Figure O-4(a) Oven Schematic-Dual cooking Condition (Microwave and Top Grill mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. DUAL COOKING BUTTON PRESSED TWICE.
4. STRAT KEY BUTTON PRESSED.

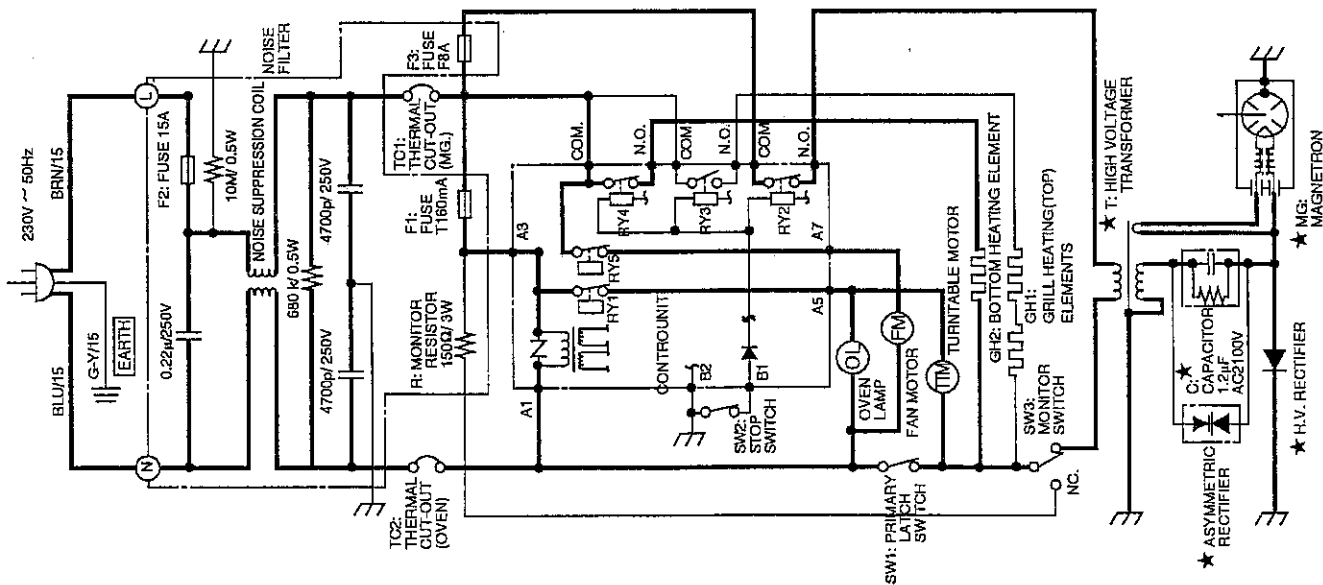


Figure O-4(b) Oven Schematic-Dual cooking Condition (Microwave and Button Heater mode)

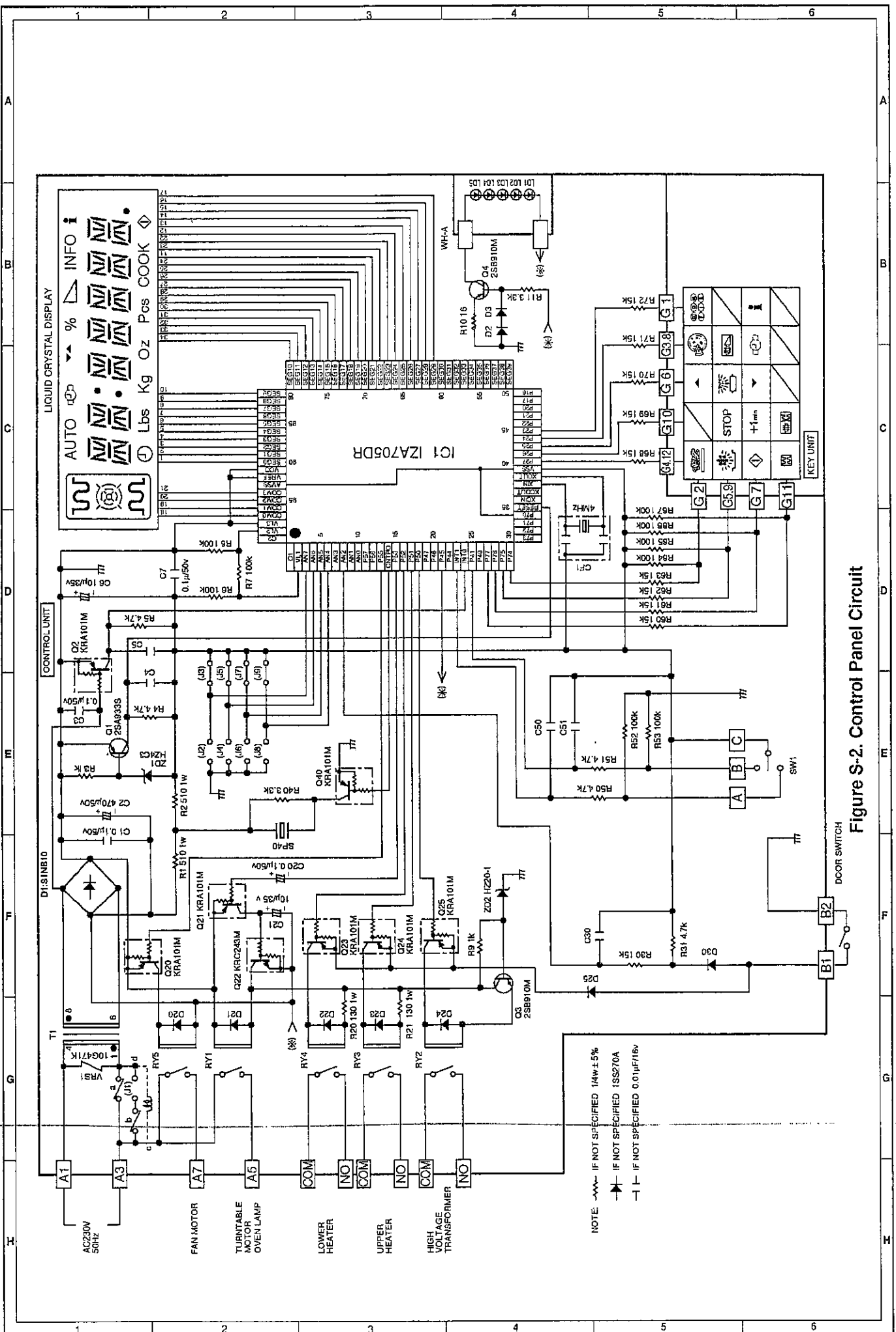


Figure S-2. Control Panel Circuit

R-4P58(B)
R-4P58(W)
R-4P58(BK)
R-4P58(W)N
R-4P58(W)F

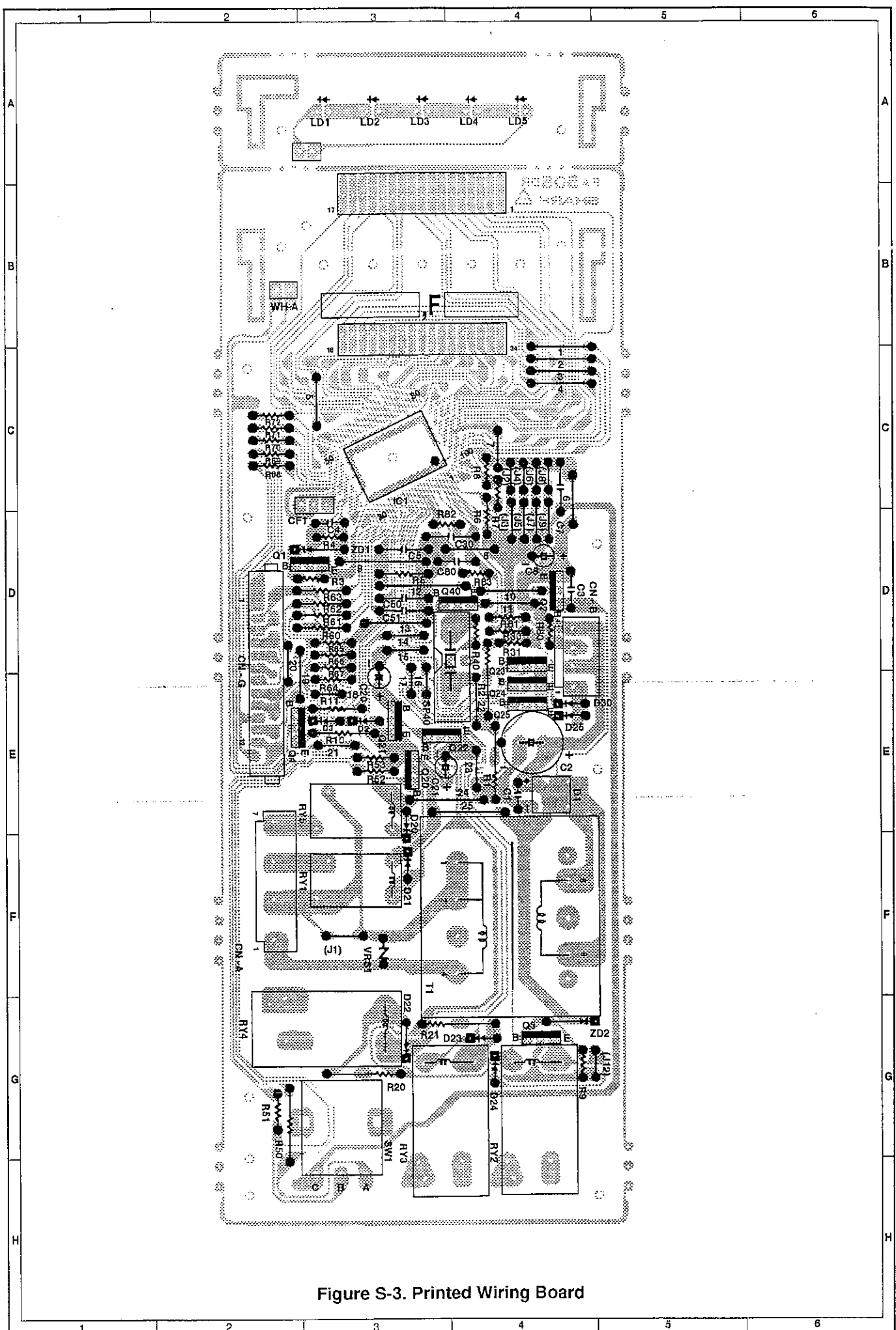


Figure S-3. Printed Wiring Board

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "S" Mark: Spare parts delivery section

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
ELECTRIC PARTS					
* C	RC-QZA188WRE0	U	High voltage capacitor	1	AW
F1	QFS-CA023WRE0	U	Fuse T160mA	1	AB
F2	QFS-CA016WRE0	J	Fuse 15A	1	AD
F3	QFS-CA014WRE0	J	Fuse F8A	1	AC
FM	RMOTEA319WRE0	U	Fan motor	1	AT
GH1	FHET-A040WRK1	U	Grill heating element assembly	1	BB
GH1-1	LANG-A040WRP1	U	Grill heater angle	1	AC
GH1-2	PREFHA046WRP1	U	Reflector	1	AR
GH1-3	QTANNA006WRE0	U	Earth plate	1	AB
GH1-4	RHET-A141WRE1	U	Grill heating element	2	AW
GH1-5	XBPWW30P05K00	J	Screw; 3mm x 5mm	2	AA
GH2	RHET-A172WRE0	U	Bottom heating element	1	AX
Δ* MG	RV-MZA243WRE1	U	Magnetron	1	BH
OL	RLMPTA067WRE0	U	Oven lamp	1	AK
SW1	QSW-MA110WRE0	J	Primary latch switch	1	AK
SW2	QSW-MA110WRE0	J	Stop latch switch	1	AK
SW3	QSW-MA112WRE0	J	Monitor switch	1	AN
* T	RTRN-A002URE0	U	High voltage transformer	1	BL
TC1	RTHM-A092WRE0	U	Thermal cut-out 125°C (MG.)	1	AL
TC2	RTHM-A039WRE0	J	Thermal cut-out 150°C (OVEN)	1	AK
TTM	FMOTDA057WRK0	J	Turntable motor assy	1	AR
1- 1	QACCVAA004URE0	U	Power supply cord	1	AQ
* 1- 2	FH-DZA035WRE0	U	High voltage rectifier assembly	1	AP
1- 3	FPWBFA304WRE0	U	Noise filter	1	AS

CABINET PARTS

2- 1	GCABUA445WRP0	U	Outer case cabinet (B)	1	AX
2- 1	GCABUA469WRT0	U	Outer case cabinet (W)	1	AX
2- 1	GCABUA419WRP0	U	Outer case cabinet (BK)	1	AX
2- 2	GDAI-A279WRP0	U	Base plate	1	AV
2- 3	GLEGPA028WRE0	U	Foot	2	AA

CONTROL PANEL PARTS

3- 1	DPWBF516WRU0	U	Control unit	1	BP
3- 1A	QCNCMA230DRE0	U	4-pin connector (CN-A)	1	AC
3- 1B	QCNCMA275DRE0	U	2-pin connector (CN-B)	1	AB
3- 1C	QCNCWA057DRE0	U	12-pin connector (CN-G)	1	AF
3- 1D	RLCDSA035DRE0	U	Liquid Crystal Display (LCD)	1	AR
3- 1E	QW-QZA003URE0	U	Lead wire (WH-A)	2	AA
3- 1F	LHLD-A165WRF0	U	LED holder	1	AC
3- 1G	PSHEPA573WRE0	U	LED sheet	1	AF
C1	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
C2	RC-EZA323DRE0	U	Capacitor 470 uF 50V	1	AA
C3	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
C4-5	VCKYD41CY103N	U	Capacitor 0.01 uF 16V	2	AA
C6	RC-EZA322DRE0	U	Capacitor 10 uF 35V	1	AB
C7	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
C20	RC-EZA302DRE0	U	Capacitor 0.1 uF 50V	1	AB
C21	RC-EZA322DRE0	U	Capacitor 10 uF 35V	1	AB
C30	VCKYD41CY103N	U	Capacitor 0.01 uF 16V	1	AA
C50-51	VCKYD41CY103N	U	Capacitor 0.01 uF 16V	2	AA
CF1	RCRS-A012DRE0	U	Ceramic resonator (CST4.00MGW)	1	AD
D1	RSRCDA013DRE0	U	Diode bridge (S1NB10)	1	AE
D2-3	VHD1SS270A/-1	U	Diode (1SS270ATA)	2	AA
D20-25	VHD1SS270A/-1	U	Diode (1SS270ATA)	6	AA
D30	VHD1SS270A/-1	U	Diode (1SS270ATA)	1	AA
IC1	RH-TZA705DRE0	J	LSI	1	AX
LD1-5	VHPSLP781C51B	U	Light emitting diode (LED)	5	AB
Q1	VS2SA933S/-3	U	Transistor (2SA933S)	1	AA
Q2	VSKRA101M/-3	U	Transistor (KRA101M)	1	AA
Q3-4	VS2SB1238/-3	U	Transistor (2SB910M)	2	AD
Q20-21	VSKRA101M/-3	U	Transistor (KRA101M)	2	AA
Q22	VSKRC243M/-3	U	Transistor (KRC243M)	1	AB
Q23-25	VSKRA101M/-3	U	Transistor (KRA101M)	3	AA
Q40	VSKRA101M/-3	U	Transistor (KRA101M)	1	AA
R1-2	VRS-B13AA511J	U	Resistor 510 ohm 1W	2	AB
R3	VRD-B12EF102J	U	Resistor 1.0k ohm 1/4W	1	AA
R4-5	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	2	AA
R6-8	VRD-B12EF104J	U	Resistor 100k ohm 1/4W	3	AA
R9	VRD-B12EF102J	U	Resistor 1.0k ohm 1/4W	1	AA
R10	VRD-B12EF160J	U	Resistor 16 ohm 1/4W	1	AA
R11	VRD-B12EF332J	U	Resistor 3.3k ohm 1/4W	1	AA

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "S" Mark: Spare parts delivery section

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
R20-21	VRS-B13AA131J	U	Resistor 130 ohm 1W	2	AB
R30	VRD-B12EF153J	U	Resistor 15k ohm 1/4W	1	AA
R31	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	1	AA
R40	VRD-B12EF332J	U	Resistor 3.3k ohm 1/4W	1	AA
R50-51	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	2	AA
R52-53	VRD-B12EF104J	U	Resistor 100k ohm 1/4W	2	AA
R60-63	VRD-B12EF153J	U	Resistor 15k ohm 1/4W	4	AA
R64-67	VRD-B12EF104J	U	Resistor 100k ohm 1/4W	4	AA
R68-72	VRD-B12EF153J	U	Resistor 15k ohm 1/4W	5	AA
RY1	RRLY-A080DRE0	U	Relay (OJ-SH-124LM)	1	AH
RY2	RRLY-A092DRE0	U	Relay (VRB18SP)	1	AP
RY3-4	RRLY-A093DRE0	U	Relay (VRB18)	2	AM
RY5	RRLY-A080DRE0	U	Relay (OJ-SH-124LM)	1	AH
SP40	RALM-A014DRE0	U	Buzzer (PKM22EPT-THAI)	1	AF
SW1	RVR-BA017WRE0	U	Rotary encoder	1	AL
T1	RTRNPA105DRE0	U	Transformer	1	AR
VRS1	RH-VZA034DRE0	U	Varistor (10G471K)	1	AD
ZD1	VHEHZ4C3///-1	U	Zener diode (HZ4C-3)	1	AB
ZD2	VHEHZ201///-1	U	Zener diode (HZ20-1)	1	AB
3- 2	DUNTKA693WRK0	U	Touch key assembly	1	AT
3- 3	GMADIA097WRR0	U	Display window [R-4P58 (W)/(B)/(BK)]	1	AF
3- 4	HPNLCB296WRR0	U	Control panel [R-4P58(W)]	1	AQ
3- 4	HPNLCB297WRR0	U	Control panel [R-4P58(B)]	1	AQ
3- 4	HPNLCB298WRR0	U	Control panel [R-4P58(BK)]	1	AQ
3- 5	JBTN-A985WRR0	U	Pizza button	1	AE
3- 6	JBTN-A981WRF0	U	Open button [R-4P58(W)]	1	AE
3- 6	JBTN-A988WRF0	U	Open button [R-4P58(B)]	1	AE
3- 6	JBTN-A995WRF0	U	Open button [R-4P58(BK)]	1	AE
3- 7	JBTN-A982WRF0	U	Rotary knob [R-4P58(W)]	1	AD
3- 7	JBTN-A989WRF0	U	Rotary knob [R-4P58(B)]	1	AD
3- 7	JBTN-A996WRF0	U	Rotary knob [R-4P58(BK)]	1	AD
3- 8	JBTN-A983WRR0	U	AUTO/DEF. button [R-4P58(W)]	1	AE
3- 8	JBTN-A990WRR0	U	AUTO/DEF. button [R-4P58(B)]	1	AE
3- 8	JBTN-A997WRR0	U	AUTO/DEF. button [R-4P58(BK)]	1	AE
3- 9	JBTN-A984WRR0	U	Combi food button [R-4P58(W)]	1	AE
3- 9	JBTN-A991WRR0	U	Combi food button [R-4P58(B)]	1	AE
3- 9	JBTN-A998WRR0	U	Combi food button [R-4P58(BK)]	1	AE
3- 10	JBTN-A986WRF0	U	Select button [R-4P58(W)]	1	AE
3- 10	JBTN-A993WRF0	U	Select button [R-4P58(B)]	1	AE
3- 10	JBTN-B001WRF0	U	Select button [R-4P58(BK)]	1	AE
3- 11	JBTN-A987WRF0	U	More/Less button [R-4P58(W)]	1	AD
3- 11	JBTN-A994WRF0	U	More/Less button [R-4P58(B)]	1	AD
3- 11	JBTN-B002WRF0	U	More/Less button [R-4P58(BK)]	1	AD
3- 12	MSPRCA045WRE0	U	Open button spring	1	AA
3- 13	MSPRCA102WRE0	U	AUTO/DEF. button spring	2	AA
3- 14	XEPSD30P10XS0	U	Screw; 3mm x 6mm	9	AA

OVEN PARTS

4- 1	DOVN-A438WRY0	U	Oven cavity	1	BQ
4- 2	LBNDKA107WRP1	U	Capacitor holder	1	AD
4- 3	FDUC-A309WRY0	U	Air duct assembly	1	AN
4- 4	PSKR-A309WRP0	U	Air separate angle	1	AE
4- 5	PDUC-A636WRP0	U	Air guide duct	1	AN
4- 6	PGLSPA480WRE0	U	Lamp glass	1	AD
4- 7	PHOK-A078WRF5	U	Latch hook	1	AH
4- 8	LANGQA446WRP0	U	Turntable motor angle	1	AE
4- 9	MSPRTA175WRE0	U	Plate spring	1	AB
4-10	NCPL-A050WRE0	U	Turntable motor shaft	1	AH
4-11	PSPA-A103WRE0	U	Spacer	1	AB
4-12	NFANJA038WRE0	U	Fan blade	1	AF
4-13	PDUC-A637WRF0	U	Fan duct	1	AL
4-14	GCABDA083WRP0	U	Back plate	1	AN
4-15	GCOVHA364WRP0	U	Bottom heater cover	1	AM
4-16	LANGFA155WRP6	U	Chassis support	1	AF
4-17	LANGQA445WRP0	U	Eart angle	1	AD
4-18	LFLG-A024WRE0	U	Bearing	1	AF
4-19	MLEVFA074WRF7	U	Open lever	1	AE
4-20	MSPR-A003WRE0	U	Heat sealed spring	1	AC
4-21	MSPRTA176WRE0	U	Heater spring	1	AB
4-22	PCOV-A004WRP0	U	Heater cover	1	AB
4-23	PCOVPA308WRE1	U	Waveguide cover	1	AE
4-24	PCUSGA372WRP0	U	Cushion	1	AA
4-25	PCUSGA317WRP0	U	Cushion	1	AB

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REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
4-26	PCUSUA459WRP0	U	Cushion	1	AC
4-27	PDUC-A633WRFO	U	Air intake duct	1	AK
4-28	PDUC-A634WRFO	U	Exhaust duct	1	AM
4-29	PSKR-A308WRFO	U	Rear barrier	1	AH
4-30	PCUSUA411WRP0	U	Cushion	1	AA

DOOR PARTS

5	CDORFA736WRK0	U	Door assembly (W)	1	BK
5	CDORFA737WRK0	U	Door assembly (B)	1	BK
5	CDORFA738WRK0	U	Door assembly (BK)	1	BK
Δ 5- 1	DDORFA766WRK0	U	Door panel assembly	1	BE
Δ 5- 2	GWAKPA421WRR0	U	Door frame (W)	1	AT
Δ 5- 2	GWAKPA422WRR0	U	Door frame (B)	1	AT
Δ 5- 2	GWAKPA423WRR0	U	Door frame (BK)	1	AT
Δ 5- 3	LSTPPA147WRF1	U	Latch head	1	AE
5- 4	LSTPPA156WRF0	U	Glass stopper	1	AC
5- 5	MSPRTA172WRE0	U	Latch spring	1	AB
5- 6	PGLSPA483WRE0	U	Front door glass	1	AX
5- 7	XCPDSD30P06000	J	Screw : 3mm x 6mm	6	AA
5- 8	GCOVHA365WRF0	U	Choke cover	1	AM

MISCELLANEOUS

6- 1	FAMI-A072WRK1	U	High trivet assembly	1	AY
6- 2	FAMI-A095WRK0	U	Low trivet assembly	1	AR
6- 3	FSRAHA060WRY0	U	Turntable support	1	AS
6- 4	NTNT-A077WRE0	U	Turntable	1	AX
6- 5	QW-QZA175WRE0	U	High voltage wire A	1	AE
* 6- 6	QW-QZA210WRE1	U	High voltage wire B	1	AD
* 6- 7	FW-VZB438WRE0	U	Stop switch harness	1	AF
6- 8	FW-VZB509WRE0	U	Main harness	1	AY
6- 9	QW-VAZ128WRE1	U	Earth wire	1	AC
6-10	TCAUHA210WRR0	U	Caution label	1	AD
6-11	TINS-A003URR0	U	Operation manual	1	AM
6-12	TCADCA001URR0	U	Cook Book (F model only)	1	-
6-13	TINS-A012URR0	U	Operation manual/Cookbook (N model)	1	AM

SCREWS,NUTS AND WASHERS

7- 1	XHTSD40P08RV0	J	Screw : 4mm x 8mm	7	AA
7- 2	XCPDSD30P06000	J	Screw : 3mm x 6mm	2	AA
7- 3	XFPDSD40P08000	J	Screw : 4mm x 8mm	6	AA
7- 4	XEPDSD40P25000	U	Screw : 4mm x 25mm	2	AA
7- 5	LX-NZ0061WRE0	J	Nut	4	AA
7- 6	XBPDSD30P08K00	J	Screw : 3mm x 8mm	1	AA
7- 7	XBPWW30P05K00	J	Screw : 3mm x 5mm	1	AA
7- 8	XOTWW40P06000	U	Screw : 4mm x 6mm	3	AA
7- 9	XFPDSD50P10K50	J	Screw : 5mm x 10mm	2	AC
7-10	XHPDSD40P08K00	U	Screw : 4mm x 8mm	1	AA
7-11	XOTSD40P12RV0	J	Screw : 4mm x 12mm	21	AA
7-12	XOTSF40P12000	J	Screw : 4mm x 12mm for (B)/(BK) models	4	AA
7-12	XOTSE40P12000	J	Screw: 4mm x 12mm (W) model	4	AA
7-13	XWWS50-06000	J	Wasaher : 5mm x 0.6mm	1	AA
7-14	LX-EZA045WRE0	J	T/T Screw (Not shown on illustration)	1	AA
7-15	LX-WZA042WRE0	J	Non return washer	1	AA

HOW TO ORDER REPLACEMENT PARTS

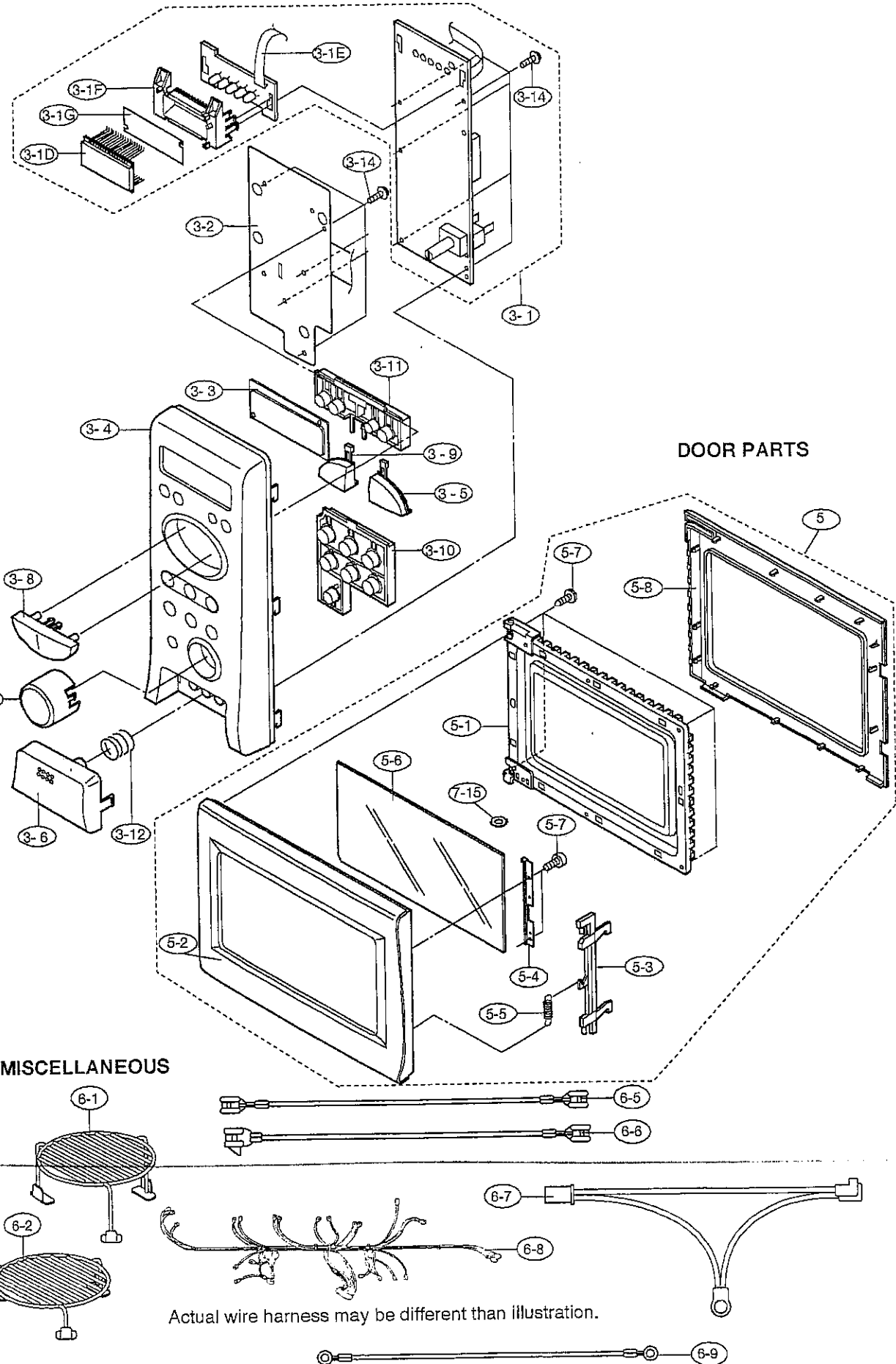
To have your order filled promptly and correctly, please furnish the following information.

- | | |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO. |
| 3. PART NO. | 4. DESCRIPTION |

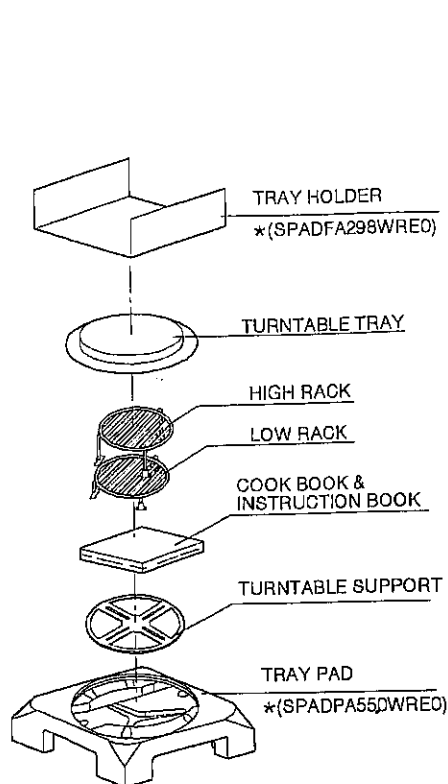
CONTROL PANEL PARTS

DOOR PARTS

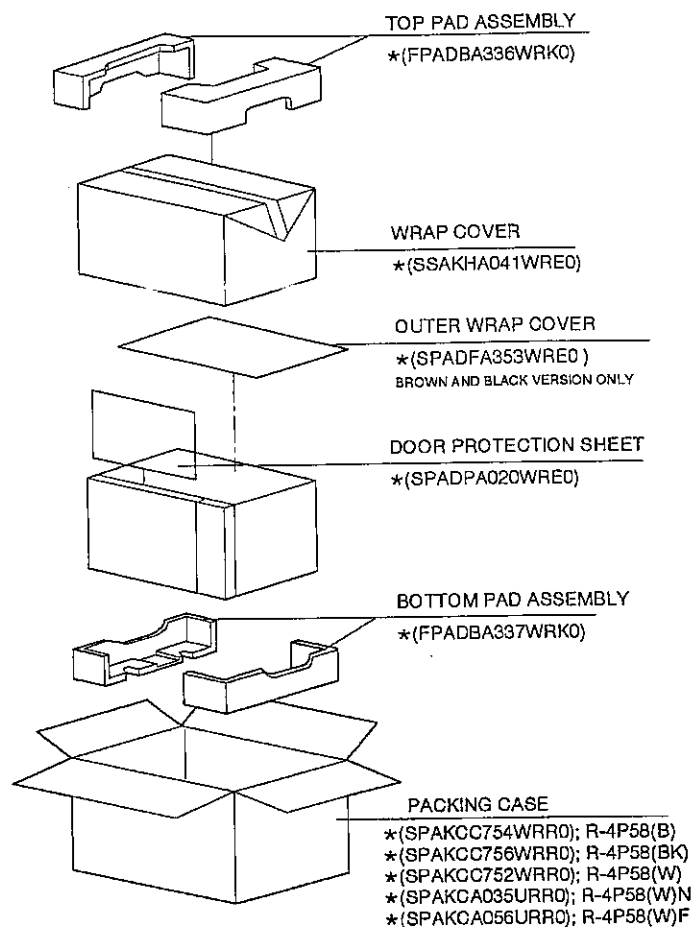
MISCELLANEOUS



PACKING AND ACCESSORIES



***Not Replaceable Items.**



SHARP®